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ONTARIO HYDRO

# News

JANUARY, 1955 -  
DECEMBER, 1956



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# ONTARIO HYDRO

# News

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Vol. 42

No. 1

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THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

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## HIS DEVOTION KNEW NO LIMIT

*"To live in hearts, we leave behind  
Is not to die."*

SO wrote the poet, Thomas Campbell, and his words seem singularly appropriate in recalling the life and great achievements of the late Robert Hood Saunders, C.B.E., Q.C.

The sudden and tragic death of Ontario Hydro's dynamic Chairman, which occurred as this issue was going to press, terminated a career of public service that has few parallels in Canada.

Mr. Saunders served with distinction as a Toronto alderman and also as a controller for several terms, and rose to receive the highest honor a grateful city could offer when the electors chose him as their Mayor in 1945. They confirmed their faith in his vigorous stewardship on three successive occasions until a post of even greater scope and responsibility beckoned to him.

With typical courage and tenacity of purpose he assumed the Chairmanship of Ontario Hydro in 1948 at the height of one of the most critical and challenging periods in the Commission's history. At this time, Hydro was grappling with the almost overwhelming demands of a prosperous, power-hungry province. Taking up the gauntlet, Mr. Saunders, with his able colleagues, moved energetically forward, placing 10 major generating stations in service between 1948 and the end of 1954.

Additional blocks of power were provided also through extensions to existing stations, as well as through interconnections with other Ontario and international sources. At the same time, far-reaching plans for future power supplies were either inaugurated or approved for actual execution.

But, it was, perhaps, in his role as the ardent and outspoken advocate of the St. Lawrence Seaway and Power Development that the illustrious Hydro Chairman made his most significant contribution to Canada's future. Repeatedly he pressed for permission to proceed with this great project, and was successful, in certain instances, in breaking down the last vestiges of effective opposition in the United States. Last year he saw his vision become a reality as the final legal obstacle was removed, and Ontario Hydro, in company with its partner, the Power Authority of the State of New York, turned the first sod for the power development. It is fitting, indeed, that his name is to be perpetuated in the Ontario phase of this important international development.

In seeking an appropriate epitaph for this noted Canadian, we humbly yet proudly quote the words of tribute from Ontario's Premier, the Hon. Leslie M. Frost: "Ontario has lost a great public servant whose devotion to her knew no limit."



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## COVER PHOTOS

OUR front cover this month is dedicated to the memory of the late Robert H. Saunders, C.B.E., Q.C., Chairman of Ontario Hydro, whose death occurred on January 16, 1955, as the result of injuries sustained in a plane crash near London, Ontario, while he was returning from a speaking engagement at Harrow.

With Toronto in the grip of winter, an enterprising staff photographer stopped to admire a North Toronto residential street, and returned with the snowy "scenic" on the back cover.

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**ALL TOMATOES** grown in Ontario do not come from garden plants. Huge quantities are produced with the aid of electrically-operated unit heaters, automatic ventilators, and irrigation machines by many Ontario producers such as the Cockshutt Greenhouses at Burlington, Ontario, described in the article "Hydro's Green Thumb," which appears on page 12 in this issue.



# "OPEN-AND-SHUT" CASE



Early tourist, Father Hennepin, would find some dramatic changes in Niagara's famed cataracts if he came back for a look today

by A. A. Bolte

AERIAL view of the Horseshoe Falls showing the control structure (top of photo), under construction, and excavation on the Goat Island (extreme left) flank as it neared completion. Outlines indicate extent of Goat Island fill and the areas to be excavated and filled on the Canadian flank. This work will be carried out later this year.





**I**F Father Louis Hennepin returned to Niagara Falls today, he'd find some startling changes in that "vast and prodigious cadence of water."

The widely-travelled missionary, who wrote one of the earliest descriptions of the cataracts after his visit in 1678, wouldn't be there long before he noted some unusual and undoubtedly eye-catching activity above the Canadian Horseshoe Falls.

Nor would it be long before Father Hennepin discovered that he was observing the important falls remedial and preservation program in full swing.

The \$17,500,000 scheme, being carried out jointly by Ontario Hydro and the United States Army Corps of Engineers (both organizations sharing the costs equally), has a three-pronged purpose:

(1) Distributing the flows over the Falls stipulated by the 1950 Niagara Diversion Treaty in such a manner that an unbroken curtain of water will be produced from shore to shore at all times.

(2) Checking the erosion now taking place in the deep notch of the Horseshoe Falls.

(3) Controlling the level of the Chippawa-Grass Island Pool so that present conditions in the pool and river upstream will remain unchanged, the American Falls spectacle will remain unimpaired, and the most effective use of water for power production will be assured.

### Control Structure

Ontario Hydro construction crews are now in the midst of building a 1,550-foot control structure on the Canadian side of the river, less than two miles upstream from the Horseshoe Falls.

Largest phase of the remedial and preservation scheme, the control structure will consist of 13 sluiceways, each of which will contain a 100-foot long submersible-type gate weighing 100 tons. Across the top of these gates, a deck of prestressed concrete, the first pre-stressed concrete structure built by Hydro and believed to be one of the largest of its kind in Canada, will serve as a roadway, 24 feet wide, to permit easy access to the various gates.

To build the control structure, Hydro engineers devised a new type of sectional cofferdam to withstand the heavy water flow. The cofferdam consists of a series of 7½-ton interlocking steel frame cribs, equipped with rollers and guides.

Each crib is lowered into the river



**MAP** photo, based on records kept since 1764, indicates how the Horseshoe Falls has receded in 200 years. From 1842 to 1905-06, rate was 4.2 ft. per year; between 1906 and 1927 falls receded about 3.2 ft. per year. From 1927-1950 the rate was 2.2 ft.

by crane, being secured to the adjoining crib. Then six "H" piles are driven down into solid rock through that end of the crib which extends out into the river. Three layers of six-ton concrete slabs (36 to a crib) are laid across the top of the crib to provide the necessary ballast.

Cribs are placed in two parallel lines or "legs" to form the upstream and downstream sections. A bulkhead joins those ends of the two "legs" which jut out into the water while steel sheet piling is driven along the outer perimeter of the U-shaped cofferdam.

The enclosed area is then ready for unwatering to permit construction of a section of the control structure in the "dry."

### Six-Stage Project

Construction of the control structure is being carried out in six stages—two stages at a time. In the No. 1 and 2 stages, all the concrete has been poured

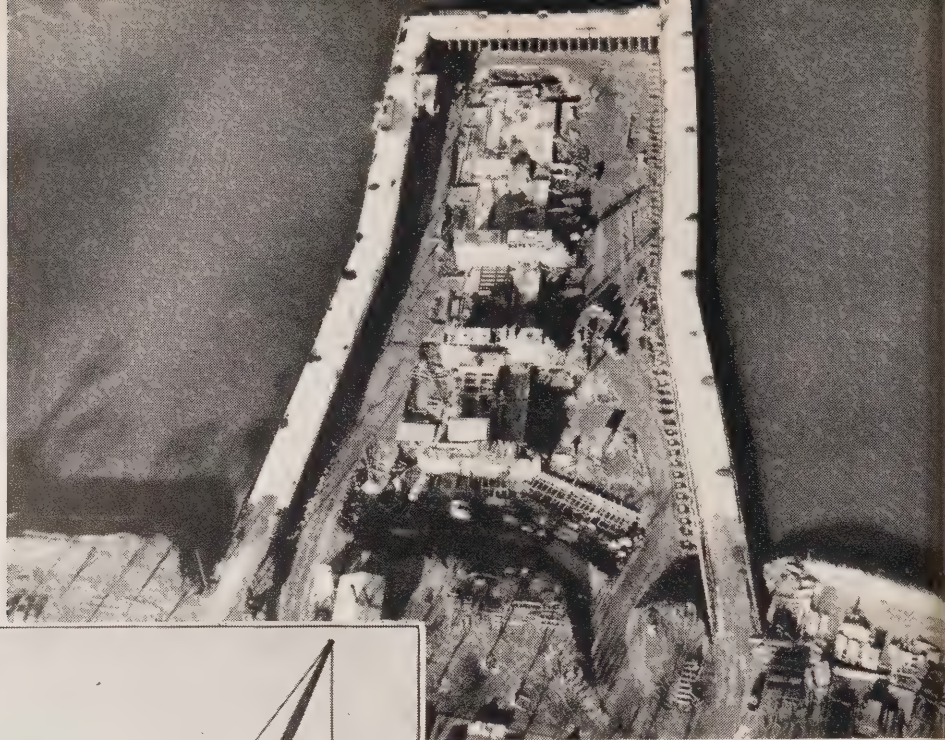
for the four large sluiceways, or openings, in the dam, while pouring of the concrete for the piers also is proceeding. All this work is progressing behind the watertight enclosure of the big steel cofferdam. Actually the steel and concrete in the cofferdam for the first two stages will be salvaged and used in the succeeding four stages until the dam is built. This will mean that the cofferdam cribs from the completed stages will be "leap-frogged" out into the river to enable progress to be made on the succeeding stages. In this way, steel cribs used in stage No. 1 will be used in stage No. 3 and so forth.

When the first section of the control structure is completed this spring, two short cofferdams or stub ends will be built across the end, sealing off the second section. The upstream and downstream legs or walls will then be removed so the waters of the river can

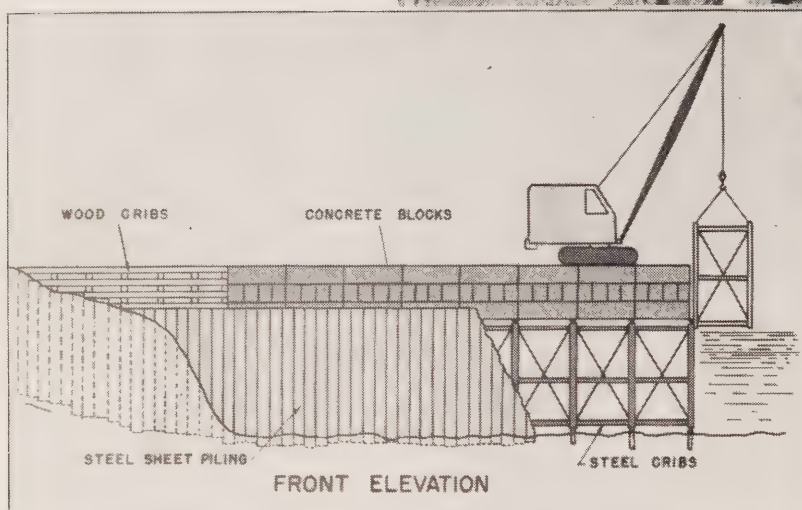
*(Continued on page 4)*



AERIAL view showing work underway on the first and second stages of control structure.



The drawing on the left shows the various components of a typical cofferdam "leg."



flow freely through the completed control gates. As each section is completed, access to the stages under construction will be made over the deck superstructure and down a ramp.

The new control structure is being built to conform with the provisions of the Niagara Diversion Treaty ratified in 1950 by Canada and the United States.

Under this Treaty, certain minimum amounts of water must flow over the Falls at specified times of the day and seasons of the year. At the same time, it provides for the re-development of power on both sides of the river with the Chippawa-Grass Island Pool area being designated as the site of intake works for any new hydraulic projects. In other words, water in excess of the minimum amounts required to flow over the twin cataracts may be diverted for power generation purposes.

To determine the type of remedial measures necessary to fulfill the terms of the treaty, tests were conducted on hydraulic scale models built by Ontario Hydro and the Corps of Engineers, U.S. Army. These models accurately reproduced the topography of the river bottom and the flow of water in the Niagara River.

At the point where the control structure is being built, the river is roughly divided into two channels separated by Tower Island. The Canadian channel which leads to the Canadian or Horseshoe Falls is the deepest, having a depth of between 10 and 15 feet. The United States side flowing to the American Falls is shallow by comparison, with an average depth of only five feet of water.

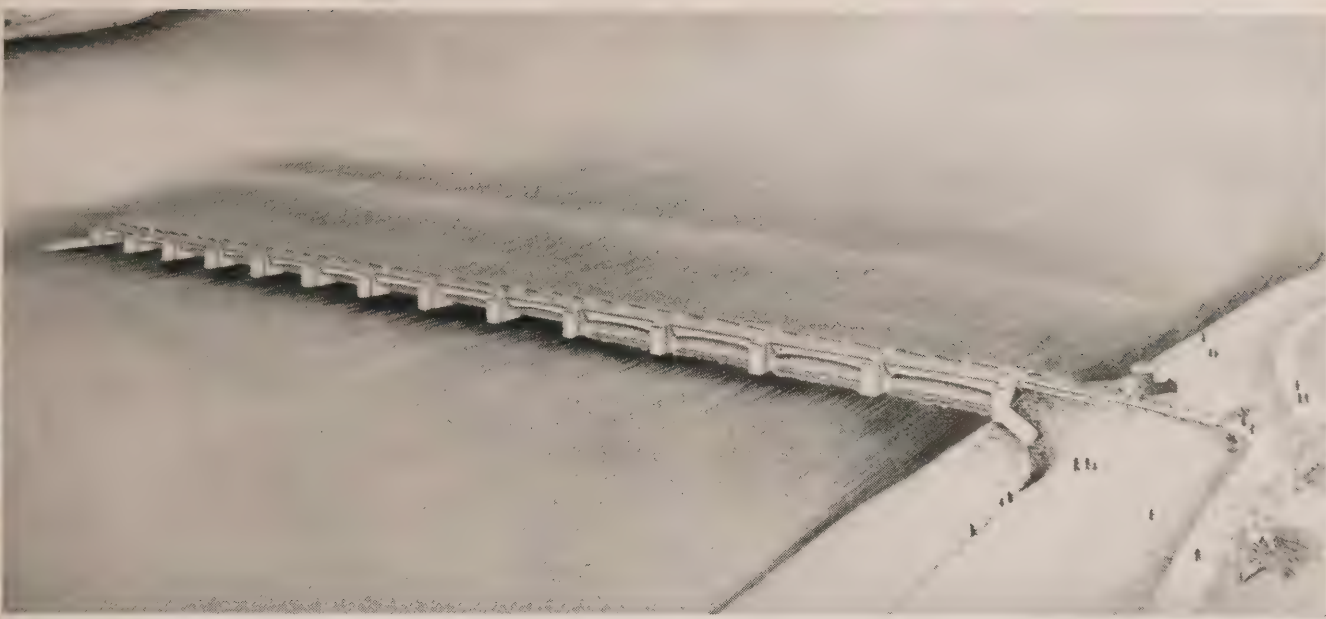
Tests on the scale models revealed that if all the water permitted for power

generation on both sides of the river were drawn off from the Pool area in the absence of remedial measures, the level of water in the Pool would be lowered by as much as five feet. Such a condition would not only lessen the power potential of any new power projects, but would also expose the river bed in the American channel and consequently have the effect of virtually drying up the American Falls.

The control structure is, therefore, designed to counter this situation. Operating like a dam, it will retard the river and thus permit regulation of the water level in the Pool area. By maintaining this level, the present satisfactory amount of water flowing down the United States channel to the American Falls will not be jeopardized.

The submersible-type gate being used in the structure allows a high degree of flow regulation. Hinged to the sluiceway near the bottom of the river, it operates in much the same manner as a drawbridge over a moat. When the gate is in an upright position, no water can flow through. As it is lowered, the river floods over its top. The lower it goes, the greater the amount of water which can pass through.

The Niagara Diversion Treaty has already provided Ontario Hydro with the



(Architect's sketch)



**COMPLETED** control structure will be 1,550 ft. long, and will consist of 13 sluiceways equipped with submersible-type gates weighing 100 tons apiece. A deck of prestressed concrete will permit access to gates.

opportunity to redevelop power on the Canadian side of the river. As a direct result of its ratification, the Commission commenced construction of the mammoth, 1,828,000-horsepower Sir Adam Beck-Niagara Generating Station No. 2 in December, 1950. Seven of the new plant's 100,000-horsepower units were in operation by the end of 1954. The twin intake works, at the Chippawa-Grass Island Pool area associated with the project, are now drawing about 40,000 cubic feet of water per second from the river.

Without remedial measures, this quantity of water would have the effect of lowering the water level in the Pool area by about two and one-half feet.

This condition, however, is corrected by present construction on the control structure. Because the gates are brought into operation as each stage is completed, there will always be either sufficient cofferdamming or control structure—or a combination of both—in the river to perform the ultimate function of the structure for present power requirements. The operation of all 13 gates will only be required when water available to the United States under the Niagara Diversion Treaty is being fully utilized for power generation.

#### Flank Excavations

While building of the control struc-

ture is the largest phase of the remedial works program, certain excavations and fills are being undertaken on both flanks of the Horseshoe Falls to enhance their scenic grandeur by creating an unbroken curtain of water over the crest-line. Such work will also arrest progressive erosion which, in less than 200 years, has worn back the Falls by 880 feet.

This erosion has had its greatest effect at the centre of the Horseshoe Falls. The largest amount of water flowing over the brink is concentrated at this point, leaving only bare trickles along the flanks. To remedy this situation, 64,000 cubic yards of rock in the channel will be removed from the Canadian end, while excavation of 30,000 cubic yards of rock from the Goat Island flank has been completed by the U.S. Army Corps of Engineers, through its contractor, McLain Construction Co.


Similar channel excavation will be carried out by Ontario Hydro on the Canadian flank near Table Rock. This excavation will be to an average depth of 4½ feet, and in some places over nine feet deep, within an area of about eight acres. This work will bare the falls behind a diversionary dam for some 500 feet from the shore and for about 200 feet upstream. It was not

feasible to carry out both flank excavation jobs at the same time, because it would have compressed the water into too small a section.

The newly-created channel on the Goat Island flank, will induce additional flow to that side from the deep pools in the upstream cascade section of the river, providing a good curtain of water on that flank. A concrete retaining wall and crest fill of some 300 feet will eliminate the incidental flows at this side of the falls. A similar effect will be created by the channel excavation and a 100-foot crest fill on the Canadian side of the cataract, this year. With both flank channels tapping the upstream deep pools it will mean that less water will be concentrated in the notch or centre of the falls. It will then be spread more uniformly over the entire 2,200-foot wide crest, providing an unbroken curtain of water over the cataract. New observation points at both flanks in the crest fill areas will offer excellent vantage places from which to obtain close-up views of the falls.

The unique project is of historic significance, since it is the second major effort by both Canada and the United States working jointly to preserve and enhance the natural wonder of Niagara Falls.





## PATHWAYS TO POWER

### Chapter 1 (Part 1)

# SOURCES OF POWER

By E. G. Tallman, B.A.Sc., C.E., and J. O. Gorman,  
B.A.Sc., M.M.E., Generation Department

*(With this issue, Ontario Hydro News commences publication of a series of articles by members of the Commission's engineering staff designed to give the reader an insight into the various stages involved in providing electricity for the rapidly-growing number of Hydro customers from the Ottawa River west to the Manitoba boundary.—The Editor.)*

**N**ATURE provides many sources of energy which, in theory at least, can be modified or converted into agents for the production of electric power.

#### Sun and Wind

The sun is the original and greatest of all primary sources of energy. In recent years, experiments have been conducted with a view to utilizing the sun's heat as a substitute for expensive fuels at steam-electric generating stations. Due to the rotations of the earth, the sun is continually changing its position, so that trapping the solar rays was found to be much like gathering coal from a pile which was constantly shifting like the sand-dunes of the desert.

To overcome this problem, elaborate machinery, analogous to the automatic equipment installed in astronomical observatories for following in correct focus the movements of the celestial bodies, has been devised. By such means, with the assistance of ingenious ancillary apparatus, the sun's rays, coming from any angle, can be concentrated for heating purposes at the required temperatures. No adequate method has been discovered yet, however, of storing the sun's heat. When night intervenes, or even a spell of daytime cloudiness, the "solar engine" becomes inoperative. This means that, in high latitudes, it is completely out of commission during the months of winter darkness. In the temperate zones it is available only at irregular intervals. Even in those tropical or semi-tropical countries favored by almost uninterrupted sunshine, it can have only a part-time or auxiliary function during the daylight hours.

The wind is another source of primary energy which has attracted the attention of experimenters in the power production field.

Provided generating units are of relatively small size—a capacity of 5,000 kilowatts would appear to be approximately the maximum—there is sufficient energy



in a strong, steady wind to operate them at the required speed through the medium of specially-designed windmills and associated power house equipment.

In theory, any number of wind-driven generating units could be installed to build up power production. For an output equivalent to that of Hydro's Sir Adam Beck-Niagara No. 1 Generating Station, about 100 units would be required. As the wind is a very uncertain factor in Ontario, and as, like the heat of the sun, it cannot be stored, such elaborate and inconvenient arrangements would have little, if any, value as far as power production is concerned.

#### Mineral Sources of Energy

A great deal of potential energy is stored in the earth's crust in the form of

coal, oil, uranium and other minerals, which can be converted by combustion or other chemical or physical methods into heat-giving agents. Coal and oil are at the present time employed for generating the steam required to turn the turbines in steam-electric generating stations, but research, in this atomic age, seems certain to provide, and perhaps at not too remote a date, other mineral sources of an even more efficient character.

All this latent energy has, however, been built up by processes extending not over calendar years, but over long geological eras. Man, as it were, has been presented with a well-filled storehouse for his needs and, through his intelligence, has been given the key to unlock it; but this treasure trove is not inexhaust-

ible, and can be used up in infinitely less time than it has taken to provide it. Inroads have already been made upon the coal resources of the world, and the search for new oil fields is active and expanding.

#### Water Power — The Ideal Energy

From the point of view of conservation of natural resources, as well as of economy, water power, when it is available in abundance and on a reliable all-year round basis, is the ideal natural source to harness for the production of electricity. This is particularly the case in Ontario, where (as far as has been ascertained to date) there is an almost complete absence of commercial fuel deposits.

The never-ending cycle of the waters of the earth flowing to the sea, evaporating and returning to the land in the form of rain and snow, offers man a natural source of energy which is constantly being replenished through the effect of the sun's radiated energy. It remains for man to adapt this cycle to his needs by designing and constructing structures to control the rivers to attain a dependable year-round flow.

#### Precipitation

The power assets of Ontario, obtainable from power sites in the pre-Cambrian shield and adjoining zones, with their advantages of natural regulation, are affected somewhat by the natural decrease in precipitation which occurs as one progresses in a northwesterly direction. In south-eastern Ontario, the normal annual precipitation averages between 32 and 34 inches. A band of relatively high precipitation, averaging some 36 inches, extends along an area bordering the easterly shore of Lake Huron. The precipitation is about 30 inches throughout the eastern parts of Northern Ontario, and decreases progressively to approximately 20 inches as one moves north and west to the Manitoba boundary.

#### Geological Considerations

Energy is derived from water through its flow and fall. The geological formation of a country, in providing a series of rapid descents in the course of its river systems, as they find their way to the sea, is, accordingly, of the utmost importance to power producers.

The most ancient of rocks underlie much of Canada. Its topography, the

*(Continued on page 8)*



CO-AUTHOR E. G. Tallman visits a potential power site on a river in Northern Ontario.



size and nature of its waterways, and its scenery are in a large measure the result of the advance and retreat of continental glaciers which, at one time, covered much of the country.

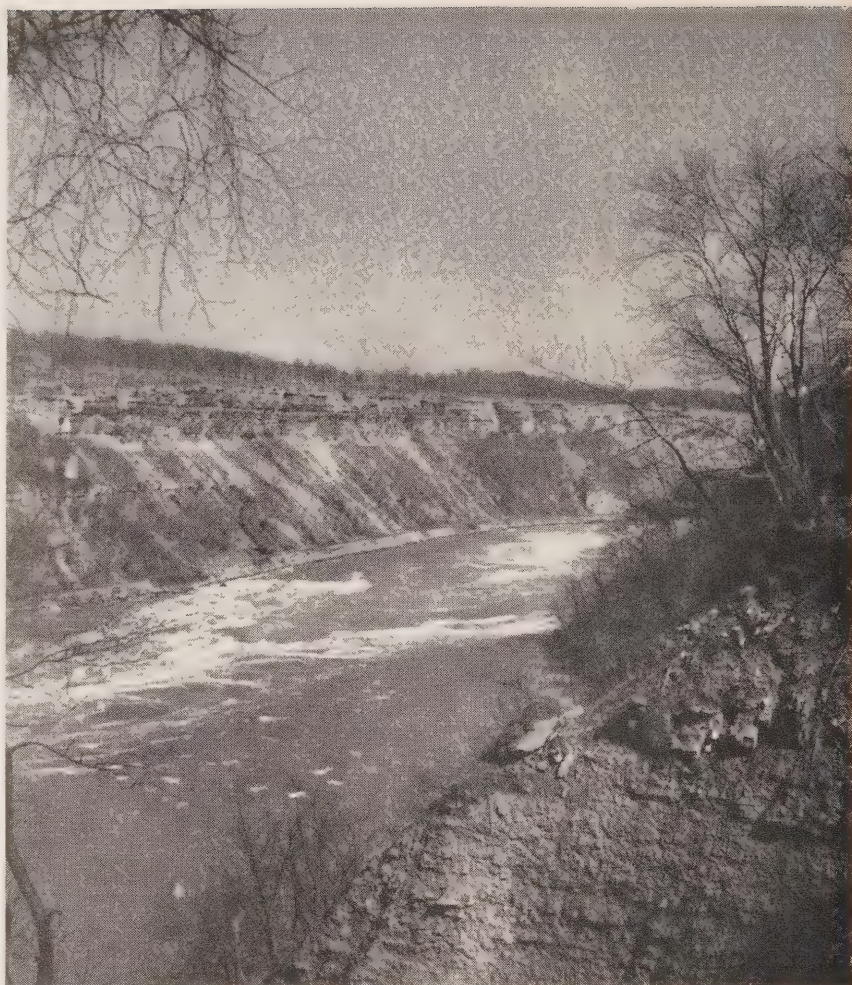
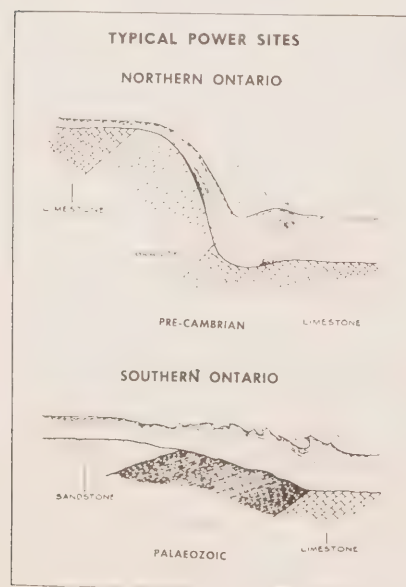
The topography of Ontario and its underlying geological formations are vital factors in the determination of its water powers. Their effects on precipitation, on formation of lakes and rivers, and on the gradients of these waterways are basic elements of our power resources.

As can be seen from a geological map of Ontario (See Figure 1, below) the underlying rocks are divided into two general types: the pre-Cambrian, the so-called hard rocks, and the Palaeozoic or young sediments, which are generally referred to as the soft rocks.

The glaciers, moving from the north and northeast, scoured most of the soil and loose rock from the pre-Cambrian areas, developing a rugged topography with numerous lakes for natural storage, and rivers with steep gradients and waterfalls, offering excellent opportunity for the development of power.

On the other hand, in Southern Ontario, where the soft Palaeozoic sediments are more susceptible to erosion and were buried under deep masses of soil which was transported from the northeast by the glaciers, there are few available power sites.

**FIGURE 1**—Ontario's underlying rocks are divided into two general types: Pre-cambrian or so-called hard rocks in Northern Ontario, and the soft Palaeozoic formations which are found generally throughout Southern Ontario.



**HARD limestone strata, overtopping beds of soft limestone and shale, were instrumental in controlling erosion and developing the steep cliffs of the Niagara gorge, thus providing one of Ontario's major hydro-electric sites.**

Fortuitous combinations of hard limestone, overtopping beds of comparatively soft limestone and shale, were, however, instrumental in controlling erosion and developing the steep cliffs of the Niagara gorge, providing a major power site unequalled in the world. In eastern Ontario, the upper reaches of the St. Lawrence and the Ottawa Rivers, together with their tributary streams, have also furnished a number of power sites, some of which are of major importance.

The retreat of the glaciers added further resources to aid in the development of hydro-electric power. The flowing melt-water from the glaciers sorted the mixed glacial soils to develop valuable deposits of clean gravel and sand throughout the province. These deposits are the source of much of the concrete aggregate

required in the construction of dams and powerhouses.

The river flow available for power development depends primarily upon the amount of precipitation, and upon the size of the drainage area above the power site. It also depends upon the nature of the vegetative cover and the soil, the proportion of lake area, and other factors. These several factors influence the distribution of the total run-off throughout the year, and determine its natural regularity. If the water supply from the watershed is very irregular, from period to period, due to physical features that encourage the rapid run-off from rain storms, storage basins frequently have to be constructed to smooth out this irregularity in supply. Fortunately, it is found that in the pre-Cambrian shield there are



large lake areas which, in the aggregate, not infrequently amount to some 15 per cent of the total watershed area; also large swamp areas. These not only provide a measure of natural regulation to the stream flow, but offer opportunities for the creation of artificial storage.

### Interlocking Drainage Areas

The height of land dividing the Hudson Bay northerly drainage from the Great Lakes south and easterly drainage in Ontario is relatively flat, although it is about 1,200 feet above sea level. As a result, the head-waters of rivers and streams originating on the divide, and flowing either northward into Hudson Bay or southward into Lake Superior, present something of the phenomenon of an interlocking network. This has been taken advantage of by the Commission in the diversion of 7,200 square miles of the north-flowing Albany River watersheds—via the Ogoki and Long Lac diversions—into Lake Superior. The diversions have provided increased water storages in Hydro's Northwestern Region and have augmented water supply conditions at Niagara and as far east as Montreal.

A thorough advance knowledge of the undeveloped water power resources in any area under consideration is essential for planning programs of future development to meet ever-increasing power requirements. Close estimates of the water power potential in undeveloped resources can be made from a surprisingly small amount of information, but an extensive program of field investigation, design study, and cost estimating, is required to determine the economic pattern and sequence of development concentrations, and for final design and construction.

After rain-water falls upon inland areas, the effect of the force of gravity continues, causing the water to spill over intervening obstacles in its tendency to flow downwards to sea level. Throughout this run-off sequence, the water constantly seeks out the lowest available routes for its downward journey. The resultant drainage mosaic is made up of numerous tiny rivulets, brooks, creeks and streams, all flowing inwards and downwards from the height-of-land edges of the drainage basin concerned, joining with numerous other streams to form the main streams tributary to the river, which empties its accumulated waters into the sea.

Not all the water which falls on a watershed as rain or snow, however, reaches the sea. A large portion is returned to the atmosphere through evaporation and vegetal transpiration. In Ontario, the average annual precipitation varies between 22 and 36 inches. About one-half of this total actually reaches the seaward-flowing rivers as direct run-off.

The undulating topography of the land surface, sloping in general to the sea, divides the drainage pattern into distinct watersheds, each drained by its own river system. The potential energy in this drainage sequence cannot be conveniently harnessed until the run-off has reached stream proportions. Before this, the supply of water at any point is insufficient to warrant the construction of the necessary structures for harnessing its small potential energy.

When a mass of water descends through a vertical distance (See profile of generating unit on page 10), potential energy is transformed into dynamic energy. This

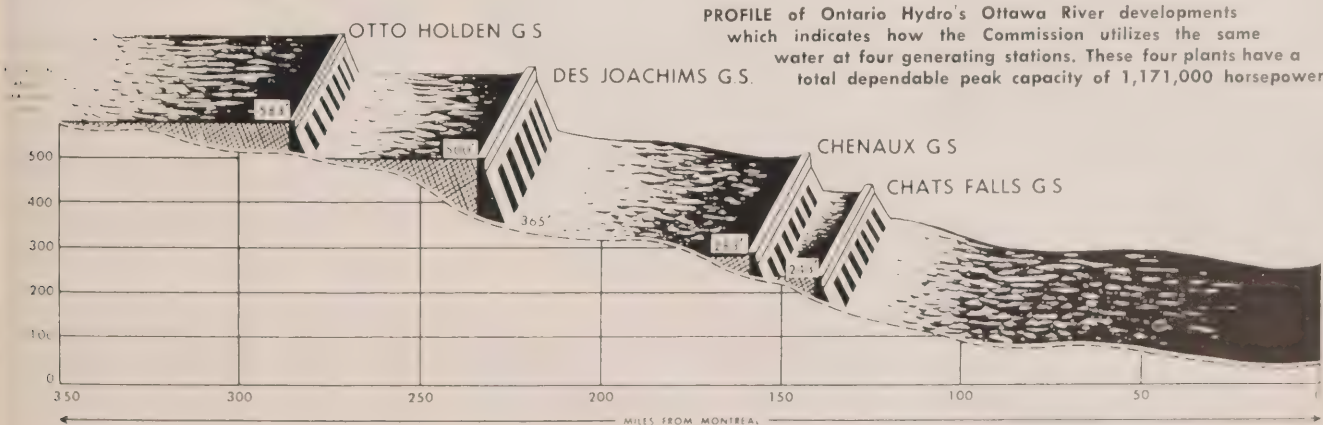
energy is harnessed and converted into conveniently transferable and usable electrical form by passing the water through a hydro-electric development. A specially designed intake structure located at the upper limit of the vertical drop collects the water and passes it downwards through a continuous watertight passage (generally called a penstock) to the propeller-like turbine installed in the powerhouse at the base of the fall. Pressing against the sloping blades of the waterwheel, with the weight of continuous flow behind it, the descending water causes the turbine to revolve. The turbine is connected directly by a steel shaft to the rotor of an electrical generator, so that as the turbine revolves the rotor revolves. With the stator or stationary part of the generator providing the necessary magnetic field, this action generates electrical energy, which, after being stepped up to the requisite transmission voltage, is sent on its way over high tension or wood pole lines to customer consumption areas.

The amount of energy produced is directly proportional to the product of (a) the quantity rate of water used and (b) the vertical distance (head) through which this water drops during its use. Where Q represents cubic feet per second and H the head in feet, the relation of power output to the quantity and head is stated by the equation:

$$\frac{Q \times H}{11} = \text{Horsepower developed (approximately)}$$

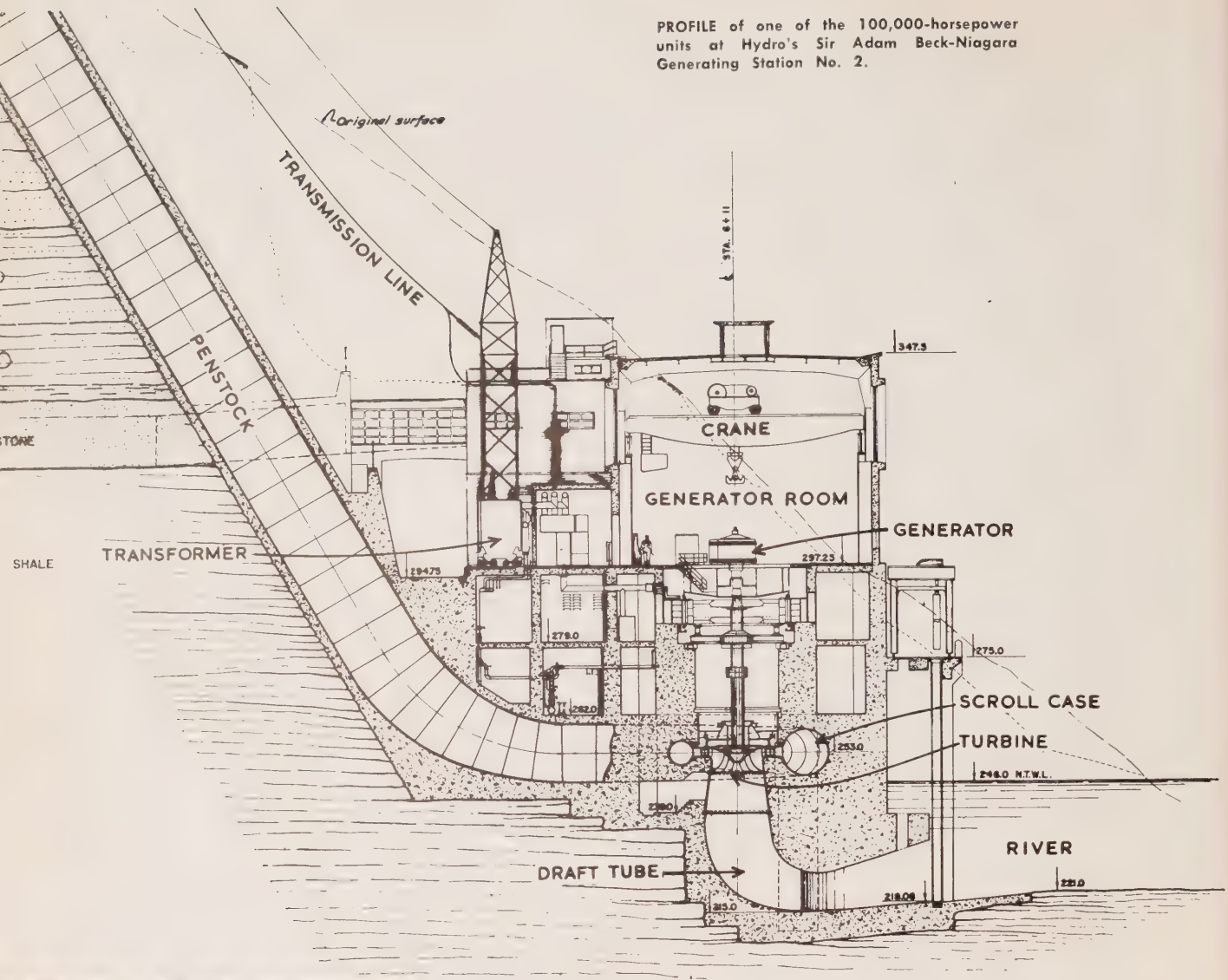
On this basis, if the quantity of water available and the total drop in the stretch of river concerned are known, the potential power available can be directly computed.

(Continued on page 10)





PROFILE of one of the 100,000-horsepower units at Hydro's Sir Adam Beck-Niagara Generating Station No. 2.



As mentioned above, a preliminary estimate of the potential power in an area can be determined quite closely if a few pertinent facts are known.

The quantity of water available in dependable supply at the point on a river under consideration can be estimated directly if stream flow measurement records have been taken. Otherwise, the supply can be estimated by weighted watershed area comparisons with other nearby rivers for which flow records have been obtained. Supply watershed areas are measured from dependable maps on which the surrounding heights of land have been carefully delineated.

IN FORECASTING run-off at a potential power site, cores of snow "drilled" by a Mount Rose snow sampler are weighed to determine the depth and water content.

The possibility of controlled water storage installations must be considered. The retention of excess water from melting snow during the spring break-up, to be discharged later during low run-off periods, will build up the dependable flow.

The potential head available for development over the length of a river, or any part thereof, can be determined from a profile based on water surface elevations taken at points along the river, if such is available. Otherwise, it may be necessary to obtain from the field the elevations of the river surface at a few specific points.

With this data, the available potential power may be estimated and the general sequence of subsequent, more refined investigation established.

(To be continued)

# TWO MORE MEMBERS

## Ignace and Christian Island Join Expanding Hydro System

**T**WO more Ontario communities are now members of the Ontario Hydro family. The village of Ignace, 157 miles west of Fort William, observed the important occasion on December 3, and Christian Island, an Indian reservation in Georgian Bay, officially received its first supply of power on December 20.

About 200 townspeople as well as representatives of nearby communities, Hydro and the Canadian Pacific Railway, gathered in the public school at Ignace to celebrate the new milestone in the history of that small railway community on the Trans-Canada Highway.

D. I. Nattress, Manager of Hydro's Northwestern Region, told the gathering that the Hydro line into Ignace was capable of supplying more than the community's needs and would provide ample capacity for municipal growth. Mr. Nattress said the availability of power could have a beneficial effect on the population of Ignace and the surrounding district. New residents or suitable industries moving into the area near the Trans-Canada Highway could be served from the new Hydro line into the community which runs parallel to the highway for 13 miles west of Ignace.

Several speakers paid tribute to J. R. Pattison, Chairman of the Fort William Hydro-Electric Commission, for his efforts in helping to obtain power for Ignace. Mr. Pattison, it was recalled, had presented a petition to Hydro Chairman Saunders at a convention of District 3, O.M.E.A., held during August, 1953, at Dryden. The same day, Mr. Saunders travelled 60 miles to Ignace to survey the situation.

Mr. Pattison, for his part, praised Hydro for the speed and efficiency with which the work had been done. Hydro came to Ignace only 14 months after the original petition was presented to Mr. Saunders—and at that Ignace was 13 days ahead of schedule in becoming a new member of the large family of associated Ontario municipalities.

Situated on Agimak Lake, in the prosperous District of Kenora, Ignace is a divisional point on the Canadian



**CELEBRATING "Hydro Day" at Ignace, D. I. Nattress, Manager, Northwestern Region (left), congratulates Ignace Reeve Tony Smilsky. Participating also were, left to right, F. R. Turner, Port Arthur, J. R. Pattison and C. H. Moors, Fort William, and E. R. Martyn and Kenneth N. Bodkin, both of Port Arthur.**

**CHRISTMAS came early to Christian Island—December 20, 1954—as Hydro Chairman Robert H. Saunders lighted large tree to inaugurate Hydro service for the reservation.**

Pacific Railway's transcontinental line. Prior to December, the village had been receiving a limited amount of power from the railway's fuel-electric generating facilities, but the community's increasing demands for electricity made it imperative that other arrangements be made.

### Christian Island Ceremony

Darkness was closing in on Christian Island as Hydro Chairman Robert H. Saunders closed a switch that lighted up a giant Christmas tree standing outside the Island's community hall. Just about everybody on the Island was there, from babes in arms to elderly men and women. As the multi-coloured lights of the great tree glowed softly through the gathering darkness, they found grateful reflection in the faces of wide-eyed children and in the countenances of the usually unemotional elders of the Band.

Mr. Saunders predicted a period of economic advancement and an improved standard of living for the people of the Island, a sentiment which was echoed by speaker after speaker throughout the evening. Reservation Chief Leonard Monague described the occasion as "the greatest moment in my life and the greatest day in the history of the Island."



The gratitude and esteem of the Indian Band was expressed during a ceremony in which Chairman Saunders was made an honorary chief of the Chippewas, with the name of Ta-Bah-Sung—"Chief of the Far Reaching Lights"—and was presented with a full-feathered ceremonial head dress. The ritual was complete from the piercing chant in the ancient Chippewa tongue to the ceremonial dance accompanied by war whoops—a dance in which Mr. Saunders played a courageous second to the lead provided by Chief Monague.

Hydro power was made possible by the laying of more than two miles of underwater cable to the mainland, the longest submarine cable-laying operation ever undertaken by the Commission (See *Ontario Hydro News*, December, 1954).  
—by J. G. Murphy.



# HYDRO'S GREEN THUMB



By Horace Brown



HEATING equipment at Cockshutt Greenhouses includes two electrically-operated oil furnaces.

ON December 31, 1927, Jack Cockshutt took the bold and decisive step that was destined to change his entire career.

Employed by Ontario Hydro in the construction of a new transmission line near Burlington Transformer Station, he purchased 15 acres of land within sight of the high tension towers he had been helping to erect.

For Cockshutt it was the fulfilment of an almost lifelong ambition. So confident was he in his abilities and ideas for market gardening that he had borrowed \$1000 to complete the acquisition of the property just west of Burlington.

Today, at 47, he is the successful owner of Cockshutt Greenhouses on New Street in Nelson Township, and three of his 15 acres are now under glass in 11, ultra-modern greenhouses. A staff of 10, including members of his own family, are associated with him in the flourishing business.

He attributes his status among the greenhouse operators of Ontario to two factors: hard work and determination to succeed, plus his constant seeking after new ways of applying the "green thumb" of electricity to the raising of marketable flowers and vegetables.

The Cockshutt greenhouses are equip-

ped with many of the latest electrical devices developed for this delicate work, some of them the first applications of their type in Canada.

Canadian greenhouse operators are at the mercy of the elements, in many instances, and a dependable supply of electricity for heating is the cornerstone of successful greenhouse operation. Although he has installed a new type of unit heater in many of his greenhouses, Cockshutt has carried the use of electricity far beyond heating. All ventilation is controlled automatically by electricity, while irrigation and fertilizing are taken care of by a new Hydro application. Mr. Cockshutt was among the first operators in Canada to experiment successfully with the use of artificial light to retard blooming, while electrically-operated refrigeration equipment keeps his flowers market-fresh after they have been cut.

Heating equipment in the Burlington greenhouses includes two electrically-operated, oil-fired furnaces. Costing \$15,000 each, and physically as large as those on large ocean liners, these furnaces consume between 125,000 and 150,000 gallons of oil annually. Although located in a 25-cycle area, Mr. Cockshutt



Jack Cockshutt sets the thermostat  
controls the unit heaters  
of the 11 greenhouses at Burlington.

WHILE winter reigns, the Burlington greenhouses grow large quantities of cucumbers and tomatoes under glass.

CONNECTED to the main water system, this electrically-operated irrigation machine waters and fertilizes growing plants.



was able to operate the 60-cycle furnaces by means of a frequency-changer set loaned to him by Ontario Hydro.

#### Unit Heaters

Typical of the pioneering spirit which has been responsible, to a great extent, for his success, this forward-looking greenhouse operator is now expanding the use of steam-fed, thermostatically-controlled unit heaters. At the present time, the temperature in approximately two thirds of the 110,000 square feet of space under glass is controlled by these new-type heaters. Perimeter heating is used in the remainder of the greenhouse space.

Mr. Cockshutt claims that unit heaters control greenhouse temperatures more readily than other types of heating equipment, particularly when sudden changes in outside temperatures occur. The unit heaters also help to minimize the danger of plant fungi when poor growing conditions exist.

But heating is only one of the many Hydro applications at Cockshutt Greenhouses which is noted for the large output of chrysanthemums.

The chrysanthemum, a favorite with Canadians, and a flower which develops more successfully in shaded locations, was

long regarded as seasonal. They bloom naturally from early October to late December outside, requiring from seven to 14 weeks to reach maturity, depending on the type of chrysanthemum.

#### Artificial Light

Now, thanks to men like Jack Cockshutt, who have pioneered in the use of artificial light for retarding the blooming period of hothouse 'mums, this popular floral species is obtainable on virtually a year-round basis.

Mr. Cockshutt started his experiments with the "slow-up" process for chrysanthemums in 1950. Using 150-watt silvered lamps, known as "neck reflectors," he applies the artificial light treatment at night to hold back the development of the young plants. When *Ontario Hydro News* visited his greenhouses he had 60 of these lamps in use for 12,000 chrysanthemums which normally take 12 weeks to reach maturity.

In this group, he planned to use artificial lighting for a period of five weeks. At that time the plants would be allowed their natural growth of 12 weeks. In other words, in 17 weeks they would be ready for the market. By varying the types of chrysanthemums and the use of artificial light, Cockshutt can be assured

of a steady supply of these flowers.

Since this novel electrical application was introduced late in 1950, Cockshutt Greenhouses has marketed 40,000 bunches of chrysanthemums with four to six stems to a bunch. Last year, Mr. Cockshutt grew blooms from 220,000 'mum cuttings, 40,000 carnation, and 130,000 snapdragons. In addition, 16,000 dozen cucumbers and some 40,000 pounds of tomatoes were produced under glass.

"I'm always trying new things," Jack Cockshutt puts it simply. He has plenty of evidence to support this statement.

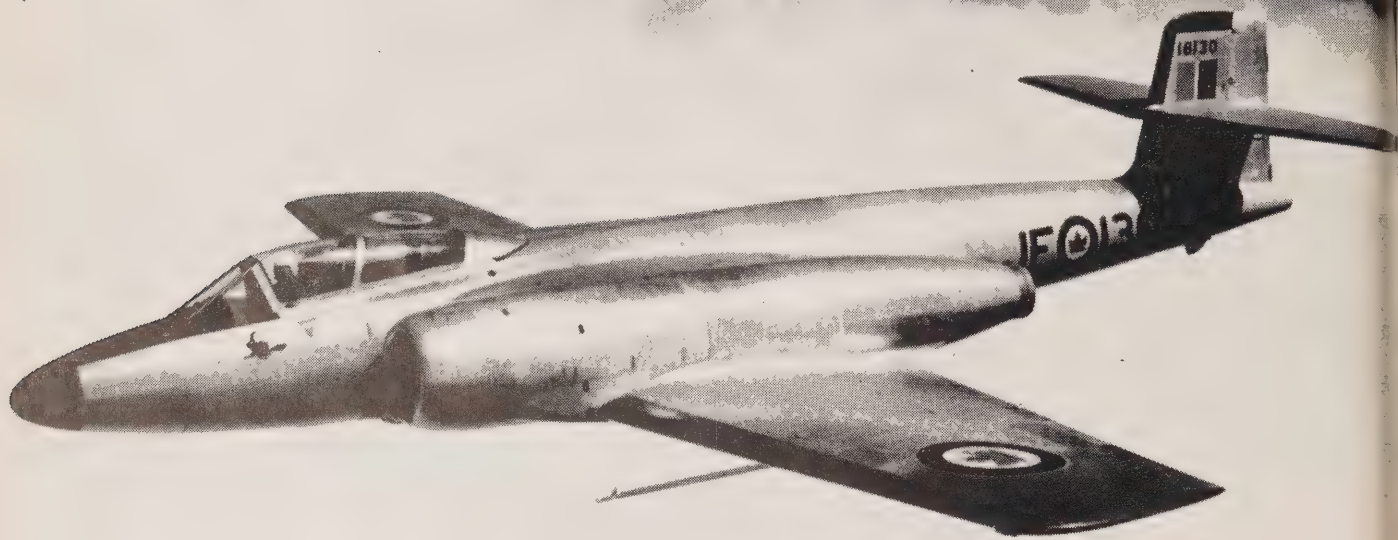
#### Automatic Ventilators

The greenhouses are ventilated automatically by 28 machines, operated by 1/4-hp motors and a modulating thermostat. He estimates that these electrically operated ventilators save him four man-hours per day in each greenhouse when ventilation is required. The new ventilators perform their function more efficiently than the former, manual-type units which were opened and closed by means of a chain, Mr. Cockshutt states.

Another unique Hydro application at the Cockshutt Greenhouses can be found in the four new irrigation machines. Cock

(Continued on page 13)





(Department of National Defence Photo)

R.C.A.F. crew members are reaching new heights and speeds in such modern aircraft as this all-Canadian, CF-100 jet interceptor.

# HYDRO HELPS RESEARCH

## Changeover at R.C.A.F. Institute of Aviation Medicine Reveals Many Unique Frequency-sensitive Items

**F**LYING by the "seat of their pants" was an oft-used description for the exploits of early 20th Century pilots.

Today, with accent on speed and greater height, science has replaced the baling wire and much of the "dare-deviltry" of flying's pioneer era.

But modern aviation science needs many tools. One of the most important is Hydro, a fact that was highlighted recently when Ontario Hydro carried out 25 to 60-cycle changeover at the Institute of Aviation Medicine at the Royal Canadian Air Force Station in Toronto. Hydro engineers and technicians discov-

ered not only the value of electricity in research, but also the particular superiority of 60-cycle power.

The Institute, which has several "firsts" to its credit in the field, is one of the world's leading aviation research centres, working along with others in the United States, Britain and other countries of the world, to help solve many new problems imposed by modern flight at supersonic speeds and stratospheric heights.

### Amazing Machines

Much of the Institute's work is accomplished with the aid of electrical machines and other equipment, which probably

would dazzle a layman, and might even amaze experienced Hydro engineers.

One of the machines, for instance, is a "human centrifuge." Designed to test an airman's ability to withstand the great "G" pressures experienced when an aircraft changes direction at high speeds, the centrifuge is a "cockpit" suspended at the end of a long arm which swings rapidly in a horizontal plane.

The term "G" is used as a convenient means of measurement in aviation parlance. A motorist is experiencing a form of "G" force, for example, when he feels he is pushed deeper into the auto seat



## By Allan A. Jones

by a sudden acceleration, especially on a sharp curve. At full speed, the Institute's centrifuge could subject its occupant to a force of 20 "G's," which no ordinary human frame could stand. The average man can take about 5 "G's" without a pressure suit, while withstanding up to 7 or 8 "G's" when wearing the pressure equipment. Beyond that point he will go into a total blackout.

Observers at the Institute can actually observe the effect on a "passenger" in the whirling centrifuge by means of an X-ray machine and television camera trained on him from the front of the cockpit.

Hitherto, this equipment, and other instruments on the centrifuge device, which was initially purchased for 60-cycle use only, has been operated through a converter switching the station power from 25 to 60 cycles. According to Squadron Leader J. Murray, officer-in-charge of the centrifuge, the direct rather than converted supply of 60-cycle power should provide steadier voltage, and hence more accurate instrument measurements.

### "Homo Cupris"

A similar benefit from the higher frequency power is expected with another Institute wonder—a newly developed electrical "copper man" which is used to test the effectiveness of flying clothing, sleeping bags, etc., in extremely cold temperatures, without having to resort to human guinea pigs.

Through electrical resistors in various parts of "homo cupris"—a mechanical man about the size of an average male, with knee, thigh and elbow joints to make him flexible—normal body temperatures can be induced in the copper anatomy. Then, with the equipment to be tested on him, heat losses can be calibrated in actual freezing temperatures. The cold test room at the Institute can simulate conditions equal to about 80° below zero.

The copper man is said to be the only flexible artificial man in the world; artificial, that is, in the sense that normal human skin temperatures can be created in him. Copper was chosen as his "skin" because it is both a good conductor, and has approximately the same radiation effect as human skin.

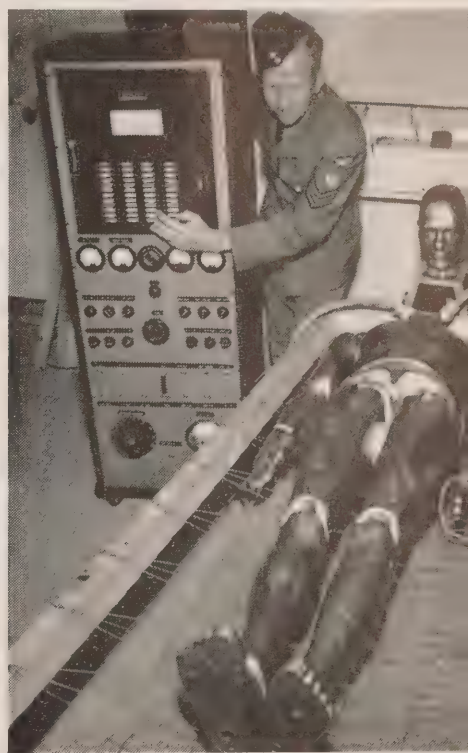
The control panel used with "homo cupris" is unique. As far as is known,

(Continued on page 29)



HYDRO changeover supervisor M. F. Attwaters (left), discusses standardization of air-conditioner motor with Flight Sergeant G. H. Barlow in the Institute's decompression chamber which can simulate atmospheric conditions at heights up to 7 miles.

FLIGHT Sergeant E. H. Pattison sets control panel used to conduct experiments with the Institute's copper "man" in testing flying clothing and other types of R.C.A.F. apparel.



HYDRO Technician S. S. Bond, shown emerging from the ingenious "cold" test chamber with an air-circulating motor altered for 60-cycle operation, found work rather chilly.



## ALONG HYDRO LINES



### Blundy Brothers Win Ballot Battle

Two brothers, Alderman Paul Blundy, of Sarnia, and Philip J. Blundy, Trafalgar Township, near Oakville, were elected to the Hydro commissions of their respective municipalities for the 1955 term on the same day with neither man knowing the other's intentions. Paul Blundy making his first bid for election to the Sarnia Commission was one of four seeking two seats. Brother Philip, making his initial bid for public office was elected to the single vacant seat on the Trafalgar Township Commission, being one of three candidates for this office.

### Preston Changeover Started January 18

Ontario Hydro, making steady progress with the frequency standardization program in Southern Ontario, made the last "cutover" to 60-cycles in Hespeler on January 17, and on the following day changeover crews moved into Preston to make the initial switch to the higher frequency. The last "cutover" is scheduled for February 24, and by this date all customers of the Preston Public Utility Commission will be operating their electrical appliances at 60 cycles.

## DR. RICHARD L. HEARN HONORED

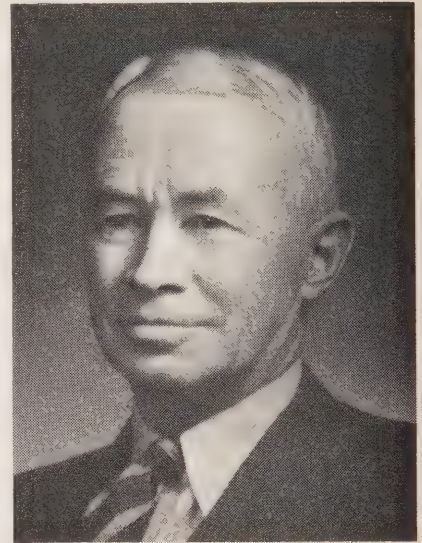
**D**R. Richard L. Hearn, Ontario Hydro's General Manager and Chief Engineer, has been honored with the award of the Julian C. Smith medal "for achievement in the development of Canada" by the Engineering Institute of Canada.

Dr. Hearn was one of two outstanding Canadian engineers recently named by the Institute to receive its 1954 awards which were established in 1939 as a memorial to the late Julian C. Smith, at one time President of the Shawinigan Water and Power Company and a Past President of the Institute.

Regarded as one of the country's most coveted engineering honors, the awards will be presented to Dr. Hearn and William G. Swan, prominent Vancouver consulting engineer, at the Institute's 69th annual meeting in Toronto next May 11 to 13.

Since first joining the staff of the Commission more than 40 years ago, Dr. Hearn has been associated with many of its major undertakings. Named General Manager and Chief Engineer of the Commission in 1947, he has played a leading role in Hydro's large-scale expansion program which has included major hydro-electric projects and Canada's largest fuel-electric installations.

Actively interested in the development of Canada's atomic resources, he is a Director of Atomic Energy of Canada Limited. He is also handling the general direction of Hydro's present initial two-year program to study the feasibility of generating electrical energy by means of



DR. HEARN

nuclear reactors being undertaken in co-operation with Atomic Energy of Canada Limited.

Dr. Hearn has received recognition on many occasions for his contribution to Ontario's publicly-owned Hydro system and to the engineering profession. In 1951 he was made an honorary member of the Association of Municipal Electrical Utilities, while, during the same year, the Commission honored his abilities by naming Canada's largest fuel-electric plant—the Richard L. Hearn Generating Station, Toronto — in his honor. In 1952, the University of Toronto conferred the degree of Doctor of Engineering (honoris causa) on him.

### Name Service Centre Manager

Appointment of Alex DeMaio as Manager of the Commission's A. W. Manby Service Centre, effective January 1, 1955, has been announced by Dr. Richard L. Hearn. Mr. DeMaio, who will report to J. M. Hambley, Deputy Assistant General Manager—Administration, will be responsible for administration of the area as a whole and for the co-ordination of such activities as the operation of the Central Garage and the various shops required for the maintenance and repair of construction plant and transport equipment.

Mr. DeMaio, whose appointment is

regarded as a further step in the development of the centre, will also hold administrative control of all unassigned construction and transport equipment and functional direction of all such equipment in use throughout the Commission.

This will entail the transfer of certain functions now performed by the Construction Plant and Equipment Section of the Construction Division, including the heavy equipment repair depot at 1379 Bloor St. W., Toronto. S. G. Hummel, Construction Division, has been appointed Plant and Equipment Engineer at the centre, while the Property Superintendent, Security Officer and Safety Officer, whose duties remain unchanged, will be attached to the Manager's staff.



## HYDRO'S DIRECTOR OF ENGINEERING ELECTED 1955 A.P.E.O. PRESIDENT

Two well-known Ontario Hydro engineers have been elected to the 1955 executive of the Association of Professional Engineers of Ontario.

John R. Montague, the Commission's Director of Engineering, has been named President of the 13,000-member association succeeding Professor W. L. Sagar, University of Toronto, who is President of the Dominion Council of Professional Engineers.

J. H. Waghorne, Hydro's Engineer-in-charge, Electrical Research Department,

Research Division, has been named to the association's executive council representing the electrical branch.

The new president of Canada's largest professional body is a native of Niagara Falls, Ontario, and is a



J. H. WAGHORNE

graduate of the University of Toronto (class of 1914) in civil engineering. A member of the association since 1923, he has served on the executive since 1950. He has been associated with the Commission since 1918 and identified with the design of almost every hydro-electric plant built by the Commission, including the recently-opened Sir Adam Beck-Niagara Generating Station No. 2. He was named Director of Engineering in 1948.

Mr. Waghorne was born at Lynn Valley, B.C. and is a graduate of Queen's University, Kingston, in electrical engineering (1939). He has been a member of the A.P.E.O. since 1946.

Newly-elected 1st Vice-President of the association is Merritt W. Hotchkiss, Kirk-



J. R. MONTAGUE

land Lake, and 2nd Vice-President is John H. Fox, Toronto. Councillors of the executive council are: (civil branch) T. N. Carter, L. F. Grant, both of Toronto, and Dean D. S. Ellis, Kingston; (chemical and metallurgical) G. W. Ames, Sarnia, P. E. Cavanagh, Toronto and C. T. Carson, Walkerville; (electrical) H. R. Osborne, Mr. Waghorne and W. J. Gilson, Toronto; (mechanical, aeronautical and industrial) J. H. Ross, Dr. G. R. Lord, Toronto, and W. S. Sheldon, Jr., Galt; (mining) D. R. Derry, Toronto and M. S. Fotheringham, Steep Rock Lake.

T. M. Medland is Executive Director; J. M. Muir, Secretary-Treasurer and Registrar, and T. C. Keefer, Field Secretary. Dean Ellis, Carson, Gilson and Dr. Lord are named to the executive by Ontario Government order-in-council.

Advisor for Youth in the Ontario Region of the Unemployment Insurance Commission. A graduate of the University of Toronto in electrical engineering, Mr. Wright has been President of District 4 O.M.E.A. and a Vice-President of the parent association. He is also Secretary of the Credit Valley Conservation Authority.

## Sudbury Hydro Plans New Home

Preliminary plans for a new building to accommodate the Sudbury Hydro Electric Commission have been completed, Mayor L. A. Landreville announced recently. Mayor Landreville said tenders for construction would be called when the architect has prepared specifications and working drawings. Space is being provided for the city's Waterworks Department on a rental basis. At the present time the Hydro and waterworks staff are located in the police-fire department building. Expansion of these public services in recent years had created the need for the Hydro and waterworks headquarters, which will be a two-storey structure, with space for meter and small equipment repair shop in the basement.

## Honor Port Dover Commissioners

Completing business officially for 1954, Port Dover Public Utilities Commission recently honored two retiring commissioners, J. H. Misner and Harry G. Varey. Mr. Misner has been active in the public life of the community since he was first elected to the village council in 1922, while Mr. Varey served as a village councillor from 1926 to 1934, being elected as a commissioner in 1935 and serving continuously in this capacity until his retirement. At the commission's final 1954 meeting, a resolution, expressing appreciation of their services, received unanimous approval while gifts were presented as tangible tokens of this appreciation.

## Long-Service Hydro Commissioner Retires

Clarence J. Craven, who retired from Dresden Hydro-Electric Commission at the end of December, 1954, with 28 consecutive years' as a commissioner to his credit, saw the town's electrical consumption almost triple itself during his long tenure of public service. Elected for his first term, Mr. Craven has been granted an acclamation successively since then, being one of 30 veteran commissioners honored at last year's O.M.E.A. convention with the presentation of long service scrolls. At a recent dinner to mark his retirement, his colleagues of the Dresden Commission presented him with a camera while Mrs. Craven received a bouquet of roses.

## Commissioner Named Employment Supervisor

W. E. Wright, P.Eng., Vice-Chairman of Toronto Township Hydro-Electric Commission, has been appointed Supervisor of the Executive and Professional Section of the Toronto office of the National Employment service. He formerly held the post of Employment

## Galt Modernizes Hydro System

Galt P.U.C., in the past four years, has completed a voltage change of its distribution and switching equipment at a cost of approximately \$66,210, Norman A. Grandfield announced at a recent meeting. The distribution system has been entirely re-insulated to handle 60-cycle power at 27,600 volts, double the previous voltage, while the Galt substations have been changed also, to operate at this higher voltage. These alterations have been made to handle increasing demands and in conformity with Ontario Hydro's policy of increasing voltage where necessary. Thus, the Commission has agreed to pay a portion of the Galt expenditure amounting to \$20,460 which represents the cost of labour and depreciated value of materials replaced.

Concurrently with this program, the Galt Commission is making extensive improvements to the older portions of its subtransmission system, and increasing the rupturing capacity of its switching equipment in the older stations.

## Engineers Request "Galloping" Reports

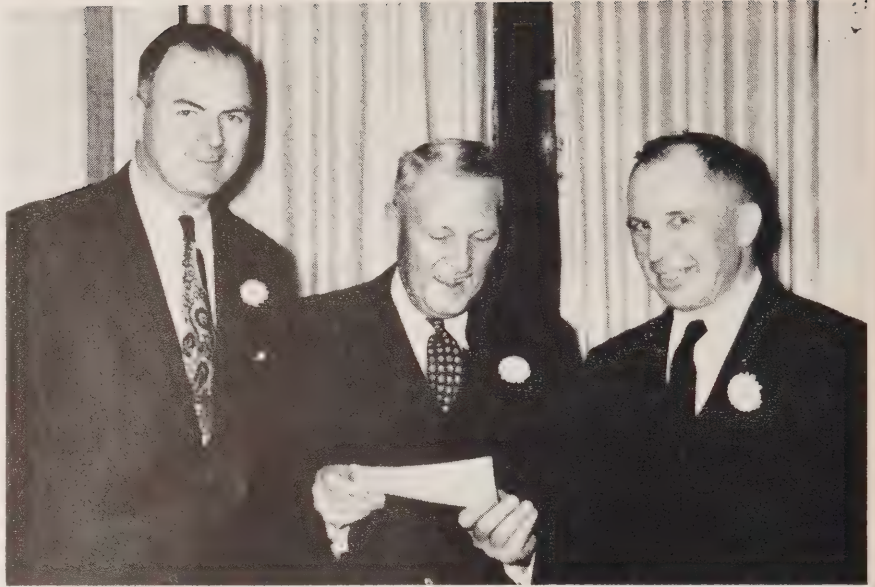
Engineers of the Commission's Research Division have requested Ontario Hydro *News* readers to report galloping of overhead conductors of transmission and distribution lines within 150 miles of Toronto. These high amplitude, low frequency vibrations can result in serious line failures. To the eye of the layman the line appears to be acting like a skipping rope, or may be vibrating up and down. This vibration is induced by wind action in conjunction with ice formation, and occurs in late fall and during the winter months.

Research engineers and their assistants are investigating this phenomenon and would very much appreciate prompt notification about galloping so that measurements in the field may be made before the vibration stops.

Please telephone the following:

A. T. Edwards (Home) Oakville  
T.L. 5-1840, (Office) Toronto F.M. 8-6767,  
(Research Division) Local 4-3039.

A. Madeyski (Home) Toronto RU 1-  
3159 (Office) Toronto EM 8-6767 (Re-  
search Division) Local 4-3039.



## GIFT FOR ORILLIA

**O**RILLIA Water, Light and Power Commission received a nice Christmas gift from Ontario Hydro a short time ago in the form of a cheque for \$7,289.

This amount represents a rebate on power purchased from Ontario Hydro between January 1 and May 31, 1954, as a system customer at a rate of \$42 per kilowatt instead of an interim rate of \$35.50 per kilowatt under the terms of the new contract. This contract actually took effect in January, 1954, after approval by Orillia ratepayers, but was not signed formally by both parties until later in the year.

In the photo above, Orillia's Mayor John R. MacIsaac, left, watches as D. G. Ferguson, Manager of Ontario Hydro's Georgian Bay Region at that time, (see page 20), presents the cheque to Orillia Chairman Harry Thiess during a dinner tendered by Mr. Thiess.

Action of the Orillia Commission in associating itself with Ontario Hydro as a cost-contract municipality is saving the local commission approximately \$1,000 per month. This was revealed at a recent meeting of commissioners who were advised that Orillia's power bill from the Ontario Commission is averaging \$6,743 a month under the new rate. If the same amount had been purchased under the old contract rate in effect in 1953 the power bill would have been about \$1,200 higher.

## Stratford P.U.C. Opens Station

Stratford Public Utility Commission has completed construction of a new 5000-KVA substation, known as M.S. No. 3, at a total cost of \$60,000.00. The new station will supply much needed reserve substation capacity as well as provide improved electrical service to all in the eastern section of the city. This is the second 5000-KVA substation which has been placed into service in the past two years. Mr. Alan Moore, Chairman of the Stratford Public Utility Commission officiated at the opening of the station on December 22, 1954.

## Classified Ads

### FOR SALE

**B**URROUGHS billing machine, style 16-1700, 12 Total, 25-80 cycle motor, complete with stand and bill holder, machine in operating condition, suitable for small utility office or as a stand-by machine. Available by March 1st, 1955. Further details available on request. Blenheim Public Utilities Commission, Blenheim, Ontario.



## HEADS TORONTO RESTAURATEURS

**C**ONGRATULATIONS are being extended to Ontario Hydro's General Catering Superintendent, W. E. LeClaire, who was elected recently President of the Toronto Branch of the Canadian Restaurant Association.

In supervising the preparation and serving of 27½ million meals in the construction camps associated with the building of new Hydro power projects in the past seven or more years, Mr. LeClaire has come to the conclusion that good food is as essential to the construction worker as high premium gasoline is to a racing car.

Now in his tenth year with Hydro, he has closely followed the Commission's policy of providing good food for construction forces as a further means of ensuring a high calibre of workmanship and continuous efficiency from every man on the job. This policy has contributed greatly to the overall success of Hydro's huge expansion program to date.

"The part played by the proper selection and preparation of food in a construction camp cannot be overestimated," said Mr. LeClaire, "particularly when it is realized that the average Hydro construction worker on the job eats an estimated six pounds of food a day."

During the construction of Hydro's huge Niagara Project, for example, Mr. LeClaire and his staff were responsible for the care and daily feeding of as many as 1,300 of the more than 7,000 peak work-force employed at the project. Mr. LeClaire was ready for such an order. Early in Hydro's expansion program, begun in 1945, a special department was set up under Mr. LeClaire to train and supervise catering personnel. Out of it came Hydro chefs and other personnel, well equipped to deal with appetites demanding as much as 7,800

### Fort William Opens New Station

Third of its type constructed in the past six years, a new distribution station has been placed in operation by Fort William Hydro-Electric Commission. Chairman J. R. Pattison announced recently. A fourth station to serve another housing area in the Lakehead city is in the preliminary stages. Designed for eventual enlargement to an 8,000-kilowatt capacity when necessary, the new plant is equipped to supply a present load of 1,800 kilowatts.



W. E. LeCLAIRE

pounds of food a day, such as was the case for more than three years at the Niagara development.

Originally from Sudbury, Mr. LeClaire was a catering contractor in Ontario and Quebec before joining Hydro. He is married and has two sons, one of whom is attending the University of Toronto.

### Safety Council Honors Belleville Meterman

Raymond Lloyd, Belleville Utilities Commission meter reader, was honored recently by the National Safety Council for saving the life of a Toronto girl at Presqu'ile Point, south of Brighton, Ontario, on August 16 last year.

Mr. Lloyd was presented with the President's Medal of the National Safety Council. The presentation was made during an accident prevention meeting of the Electrical Employers' Association by Don Cameron, Secretary-Treasurer and Engineer of the association.



R. LLOYD

The Belleville man gave artificial respiration to Lois Gillings, 18, after she had nearly drowned at Presqu'ile Point beach. With two other girls, the Toronto girl had waded into the water when the current caught her and carried her into the channel. She was carried ashore by two Brighton men following which Mr. Lloyd gave her artificial respiration for three-quarters of an hour. Mr. Lloyd's efforts were credited with saving the young girl's life.

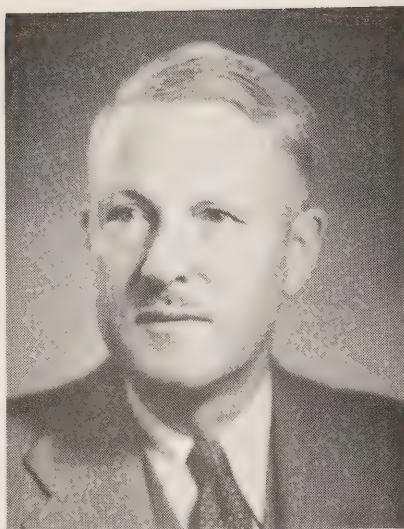


### JOIN QUARTER CENTURY RANKS

**T**WO new members joined the growing ranks of Woodstock P.U.C. Quarter Century Club, being honored at a recent dinner attended by commissioners, former commission chairmen, and staff colleagues. The 1954 Chairman, C. W. Hayball, standing, right, presented handsome silver tea services to Percy Chambers, left, and Jack Kenney, in recognition of their years of valuable service to the Woodstock Commission. J. G. Archibald, P.U.C. Manager from 1900 to 1941, recalled the early days and growth of the commission in his tribute to the two men.



J. C. FERGUSON



D. G. FERGUSON

## NAME NEW GEORGIAN BAY REGIONAL MANAGER

**A**SSOCIATED with Ontario Hydro for almost 31 years, John Clifford Ferguson has been appointed Manager of the Georgian Bay Region, with headquarters at Barrie. He succeeds Donald Gregor Ferguson who, until his retirement, will be engaged on special assignments and available for consultation as required. A. G. Brenneman, who has been Area Project Manager, Frequency Standardization Division, Hamilton, will fill the position of Operations Engineer, previously held by J. C. Ferguson. The appointments were effective January 1.

J. C. Ferguson has been with the Commission since he graduated from Queen's University with the degree of Bachelor of Science in 1924. He spent two years as an engineering apprentice before joining the Georgian Bay Division of the Operating Department as Assistant Engineer. In 1947, he was appointed Operations Engineer of the newly-established Georgian Bay Region, and went to Barrie in that position in July, 1948. Born in Admaston Township near Renfrew, Ontario, Mr. Ferguson is married and has two daughters and one son. He is a member of the Association of Professional Engineers, and of the Barrie Golf and Country Club.

Manager of the Georgian Bay Region since its inception, D. G. Ferguson is one of the oldest employees in terms of service in the Commission, having completed his 40th year last June. His career with the Commission had its inception

in 1914 in the Estimating Department, under A. H. McBride, one of the seven original Hydro employees. Mr. Ferguson's Hydro service had only one major interruption when he served with great distinction overseas with the Royal Canadian Engineers from 1915 to 1919.

Upon his retirement from military service with the rank of Major, Mr. Ferguson returned to Hydro's Estimating Department, and in 1920 was appointed Assistant Engineer, Line Construction, with the Construction Department. Three years later, "D.G." went to the Municipal Department as Assistant Engineer, where he remained until his appointment as Manager of the Georgian Bay Region.

Mr. Ferguson was born at St. Thomas, Ontario, in December, 1889, and attended high school there. He graduated from the University of Toronto with the degree of Bachelor of Applied Science. A member of the Association of Professional Engineers, he also belongs to the Royal Canadian Military Institute, the Barrie Kiwanis Club, and the Barrie Golf and Country Club. An enthusiastic amateur gardener, Mr. Ferguson is noted for the floral beauty which he and his wife enjoy about their Barrie home during the summer months.

Alvin G. Brenneman, P.Eng., as Area Project Manager, Frequency Standardization Division, has been responsible for much of the success of the Commission's huge program of frequency standardiza-

tion in the cities of London, Windsor, and Hamilton and communities adjacent to these centres. Besides this important work, he brings to his new position as Operations Engineer, Georgian Bay Region, experience in the Operating Department of the Commission, dating back to 1931, when he was stationed at London and Hamilton. From 1945 until 1948, Mr. Brenneman was with the Operating Department at Toronto as Line Maintenance Supervisor. Following this, he joined the Electrical Engineering Department as Outside Plant Engineer, Communications, transferring in September, 1949, to F.S.D. to supervise the changeover to 60-cycle frequency of London and surrounding districts.

Born in East Zorra, Oxford County, Mr. Brenneman graduated from the University of Toronto in Electrical Engineering. He was on active service from 1939 until 1945

with the Royal Canadian Corps of Signals, serving in England and northwest Europe, and being awarded the M.B.E. and E.D. Upon demobilization, he held the rank of



A. G. BRENNEMAN

Major, and from 1947 to 1949 commanded the First Corps Signals (Reserve), in Toronto, with the rank of Lieutenant-Colonel. He was President of the Canadian Signals Association in 1953.

## Orono Cuts First Rate

Approximately 76 percent of the domestic customers of Orono Hydro-Electric Commission will benefit from a new schedule of rates adopted recently by the local commission. Under the new schedule, one cent per kilowatthour was cut from the first rate for domestic and commercial customers while the second rate was increased by a fraction of a cent. The new rate is designed to reduce the rates to the majority of the customers but to assess greater charges against the larger domestic users who are responsible, to a great extent, for the peak load in the village. The decrease in the first rate under the new schedule will cut about \$1,200 from the annual revenue of the Orono Commission, it is anticipated. It has been estimated that the increase in the second rate will affect some 20 percent of local domestic customers.



# This and That

Ontario Hydro was commended by Reeve W. J. Taylor and members of the Richmond Hill Council recently for its public-spirited action in providing off-the-street parking in the vicinity of the Commission's Richmond Hill substation. Discussing a request from Area Manager L. J. Roy that one-hour parking be enforced on the new parking lot to ensure that the maximum number of motorists could enjoy the privilege, Reeve Taylor said Yonge Street, the village's main thoroughfare (part of Ontario Highway No. 11) was naturally a busy road, presenting a problem for those seeking parking space. "Hydro, in making this lot available, is helping a great deal. This will be much appreciated by people who shop and do business in the village."

An idea being tried in Scarborough (England) will seem strange to Canadian housewives. When the doorbell rings it may be "the washing man" bringing an electric washing machine, and all the housewife has to do is plug in and do her washing the easy way, a welcome contrast to the practice common in many English homes of washing clothes and other items by hand. The idea of making the washing day one of pleasure instead of grief is being tried by Phil Longbottom of Waterhouse Lane, Scarborough. For the use of the washing machine, the housewife pays him three shillings and sixpence (about 50 cents) an hour, plus the cost of the electricity she uses, and when she has finished the mobile laundry goes off to the next customer.

The only known practice comparable to this in Canada is in many apartment blocks where tenants pay a small sum for the use of a washing machine which, of course, stays permanently in the apartment basement. Extent of ownership of washing machines in the 25-cycle area of the Commission's Southern Ontario system is made evident by the estimate that 676,600 such appliances will have to be changed over from 25 to 60-cycle operation before Hydro's frequency standardization program is completed.

It is of more than passing interest to note that Cecil Boadway, the Commission's Communications Engineer, has been elected President of the Canadian Radio Technical Planning Board. In an interview with the press after his election, Mr. Boadway said the Board had completed its study to write manufacturing specifications for color television.

No estimate of how long it would take color television to come to Canada was furnished by Mr. Boadway, who said that a great deal of detail still must be studied and settled. However, he did make the significant prediction that black and white television would not be rendered obsolete when color does become an actual fact in this country.

Herbert C. Powell, the man who designed those well-known "beer-mug" lighting fixtures, still used on some of Toronto's residential streets, retired recently after 44 years' association with the Toronto Hydro-Electric System.

In the accompanying photograph on this page, Mr. Powell, left, is shown as Chairman Bert Merson presented him with a pen and pencil set on behalf of the staff. His colleagues also presented him with a clock radio, brief case, as well as two suit cases and one of his famous "beer mug" lamps specially mounted for presentation purposes.



Mr. Powell, left, is presented with a pen and pencil set by Chairman Bert Merson, Toronto Electric Commissioners.

But, fortunately enough, Mr. Powell hasn't retired in actual fact. His increased leisure means that he has more time to devote to his special interests, including an industrial survey of Toronto, as well as vocational guidance work at the University of Toronto.

Statistician with Toronto Hydro since 1919, this interesting gentleman, who recently observed his 70th birthday, made a valuable contribution to Toronto's archives by his collection of data relating to the city's industrial and electrical history. During Toronto's centennial celebrations in 1934 he, alone, organized an interesting and educational display depicting this aspect of civic history.

Keenly interested in church work and religious activities, he is also a life member of the American Institute of Electrical Engineers, a member of the Association of Professional Engineers of Ontario, and the Ruskin Literary and Debating Society.

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1954

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uch control markings as, "Left Foot;" "Right Hand;" "Left Bicep;" were never encountered by Ontario Hydro engineers before.

The centrifuge, the copper man and the "cold test" room are probably the most interesting pieces of equipment in the Institute.

However, Hydro's changeover operations affected other items in the research centre, including a decompression chamber where rarefied atmospheric conditions can be simulated for heights of up to 6 or 7 miles.

### Over 1,000 Items Altered

Throughout the entire R.C.A.F. Station—which, in addition to the Institute of Aviation Medicine, is the home of two

R.C.A.F. Auxiliary Squadrons—some 1,000 frequency-sensitive items were altered for 60-cycle operation, and according to Wing Commander F. M. Gobeil, the station's Commanding Officer, the switch to 60 cycles will be a "great benefit."

## HYDRO'S GREEN THUMB

(Continued from page 13)

shutt was the first Ontario greenhouse owner to use these electrically-operated machines, each of which is equipped with a long hose and reel. The hose is extended along the rows of plants in each greenhouse. Then it rewinds, as it sprinkles, shutting off automatically when the nozzle reaches the reel. Another automatic attachment mixes sufficient liquid fertilizer with the water to provide the proper nourishment for the plants.

Perhaps not so unique, but equally

important and essential, is the Hydro-operated refrigeration equipment for the two cold storage rooms where cut flowers are kept fresh after picking.

"My Hydro bills," Mr. Cockshutt states, "amount to about \$1,200 a year, but I consider it the best money I spend in view of the results."

Cockshutt Greenhouses is something of a family enterprise. Jack's 24-year old son, Stewart, acts as manager, while son-in-law Robert White, is in charge of shipping and sales. Mrs. Cockshutt and daughter, Jacqueline, look after the books.

"It hasn't been easy," he recalls, in looking back over the years, "but it has been very worthwhile. I wouldn't be in any other kind of business, and, as long as there are new ways of doing things by electricity, I'm going to keep on trying them."





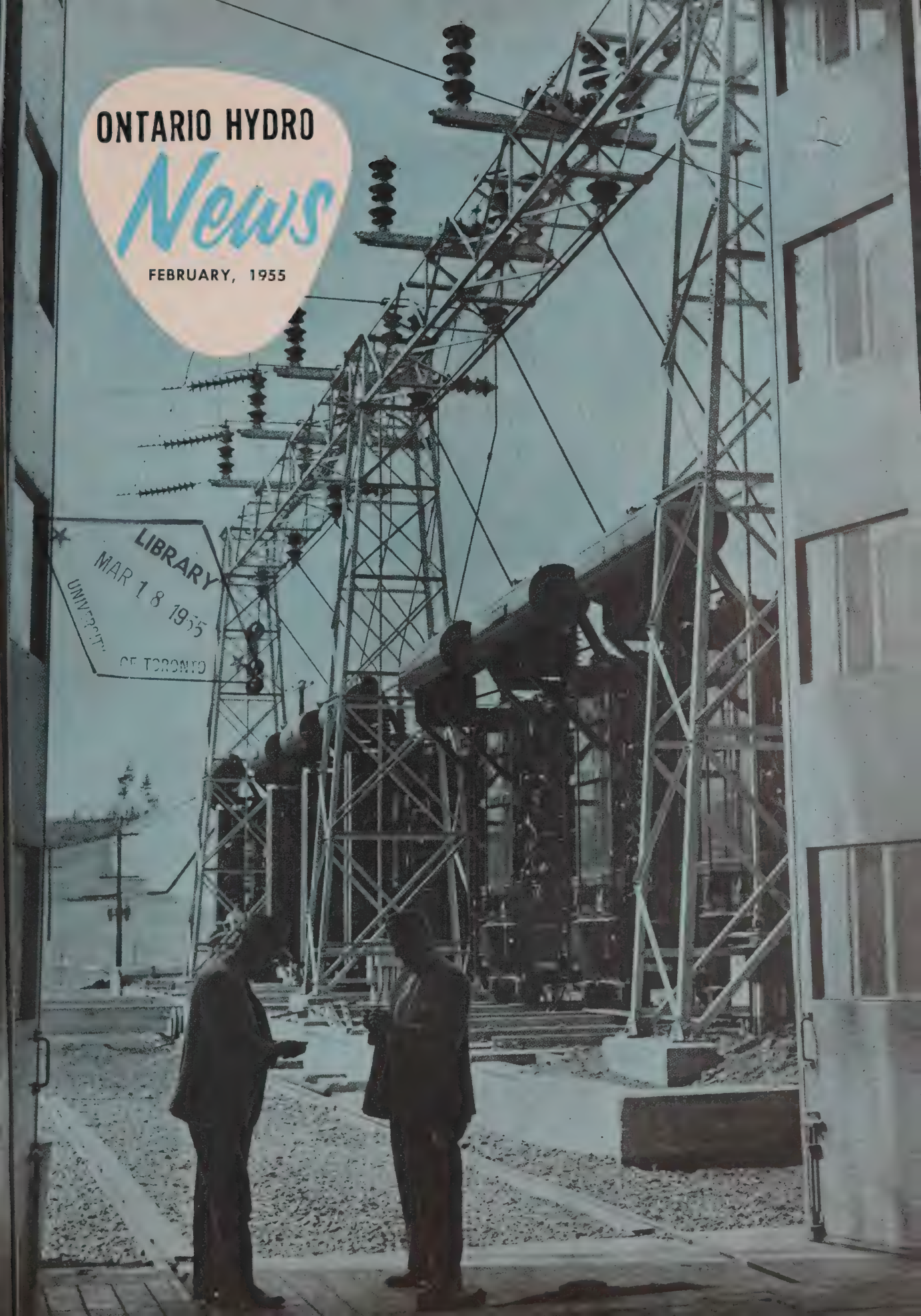


ONTARIO HYDRO

# News

FEBRUARY, 1955

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# ONTARIO HYDRO

## News

February, 1955

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No. 2

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### A "POWERFUL" PROVINCE

CANADA made many encouraging advances in 1954, but none were more significant than the continuing development of the nation's abundant hydro-electric resources.

Indisputable evidence of this fact features the bulletin issued recently by the Water Resources Division of the Canadian Department of Northern Affairs and National Resources. The bulletin reports that Canada set a new high record of 1,758,450 horsepower of hydro-electric capacity completed in the past year. This noteworthy accomplishment exceeds the previous high year of 1952 by nearly 700,000 hp., and brings the total installation in Canadian hydraulic plants to 16,684,200 hp., although this represents less than 26 per cent of the known potential resources.

The realization that Ontario Hydro last year led all other Canadian power organizations with the largest single contribution to this engineering achievement, is a source of genuine pride for all associated with the province wide Hydro enterprise. With seven units of its Sir Adam Beck-Niagara Generating Station No. 2 project in service, and favorable water conditions in most areas of the province, the Commission, at the beginning of the present year, was able to report the "brightest power picture" since the end of World War II.

The Commission had a reserve capacity of about 14 percent in the Southern Ontario System when primary peak demands reached an all-time high of approximately 4,177,000 hp. on December 21, 1954. The Commission handled these exceptionally heavy demands despite the fact that two, 134,000-horsepower units at the Richard L. Hearn Generating Station in Toronto were out of service due to mechanical damage. Although Hydro was proceeding with three other hydraulic projects, including the St. Lawrence Power development and the Manitou Falls Generating Station on the English River, as well as the two-unit addition to the Pine Portage plant on the Nipigon River, the outstanding progress on the Niagara project last year was, to a great extent, the pivot of the improved power position of Hydro's Southern Ontario System.

This progress is reflected by the fact that three more units than originally scheduled for 1954 were in service at the Niagara plant, enabling the seven units to produce a total of 811,000 hp. — 111,000 hp. in excess of their combined installed capacity — on December 21 last year. On the same day, the older Sir Adam Beck No. 1 station delivered 602,000 hp., exceeding its installed capacity by 77,000 hp. to make a combined total output at both plants of 1,413,000 hp.



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#### COVER PHOTOS

VIEWED through the main doorway of the newly-enlarged Pine Portage Generating Station on the Nipigon River, the two banks of 115-kv main power transformers shown on this month's front cover, dramatically emphasize the important contribution this station is now making in Northwestern Ontario with completion of the fourth and final unit. The plant now has a dependable peak capacity of 158,600 horsepower.

The photograph on the back cover shows workmen pre-assembling a section of the 16-foot diameter steel tunnel, one of two tunnels being built under the Cornwall Canal leading to the site of Ontario Hydro's St. Lawrence powerhouse.

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TOURISTS who visit Ontario's observation plaza at the base of Niagara's Horseshoe Falls during the summer would scarcely recognize the popular vantage point in its eerie winter dress.

# LIFE'S WORK WELL DONE

By A. A. Bolté

*"Life's race well run,  
Life's work well done,  
Life's victory won,  
Now cometh rest."*

—Author Unknown.

TWO months after assuming the chairmanship of Ontario Hydro, Robert H. Saunders paid a surprise visit to the northern Ontario community of Porcupine. There, at the local Hydro Club's annual banquet, he said:

"In my position I would like to know this province of ours better. I would like to know its difficulties and how Ontario Hydro can help. When I consider its importance, Hydro throws out a challenge to me . . ."

During the next seven years he accepted his own challenge. His insatiable desire to understand the people of Ontario and to learn their problems, knew no bounds. Convinced that Hydro was "the greatest single economic factor that can bring prosperity to the province of Ontario, and, yes, to the Dominion of Canada," he determined that Hydro would carry out that trust by providing the province with sufficient supplies of

electricity through the development of Ontario's waterpower resources.

And because he believed that Ontario Hydro, and he as its Chairman, were servants of the people, he personally undertook the job of telling Hydro's story in every city, town, village and hamlet of Ontario. "One thing I do hope," he once said, "is that we shall be able to let the people of Ontario know that Hydro is really a public utility owned by the people of this province."

This sense of duty and service became so much a part of his job that it was not unusual to find him making several trips every week to carry out his self-imposed obligation. Such was the case on the night of January 14, 1955, when he went to the Town of Harrow to address a group of fruit growers. Because he had to be in Niagara Falls the following morning, he made the trip in Hydro's amphibian plane. Near midnight, on the return flight to Toronto, the aircraft made an emergency crash landing near London. Chairman Saunders was seriously hurt. Early in the morning of January 16, he died.



A FEW hours before the 'plane crash in which he sustained fatal injuries, Mr. Saunders was photographed with William Murdoch, right, M.P.P., Essex South, during a fruit growers' meeting at Harrow, Ont.

His sudden and tragic death terminated one of the most vital chapters in the history of Hydro. Robert Hood Saunders, variously described as dynamic, colorful and versatile, was the instrument through which that history was written.

When he accepted the appointment in 1948, Robert Saunders brought with him a wealth of experience which was characterized by hard work and unbounding energy. No job to him was too great or too difficult to attempt, nor was it ever too small or too menial to be unworthy of his attention. He felt equally "at home" in the complex field of international negotiations as he did in lending a hand with special mailings by licking envelopes and stamps in his office.

Although he guided Hydro through its greatest expansion program, which included the placing in operation of 13 new power sources and the commencement of two other projects now under construction, he was, perhaps, the most important personality in the long fight for the St. Lawrence Power Project. Shortly after taking office, he made this





**PRESIDING** at his first Commission meeting a few days after assuming the chairmanship in March, 1948, Mr. Saunders was congratulated by his new Ontario Hydro colleagues. Left to right are Dr. Richard L. Hearn, W. Ross Strike, Mr. Saunders, Hon. Geo. H. Challies, Dr. Otto Holden, and A. W. Manby, with E. B. Easson standing.

project a personal campaign and crusade. He vowed never to speak in public without mentioning the St. Lawrence and the great need for the harnessing of its power potential. Approximately five months before his death, he was able to tell the people of Canada and the United States that he had kept that promise as the first sod was turned to start construction of the mighty power development.

The man who was destined to become head of Canada's third largest enterprise as Hydro's sixth Chairman lived by hard work all his life. It might be said that the life of Robert Hood Saunders, who was born on May 30, 1903, was being shaped while Sir Adam Beck, who came to be known as "the Father of Hydro," was campaigning for a publicly-owned electrical enterprise.

The son of a Toronto fireman, he attended King Edward and Hillcrest Public Schools where he was looked upon as a rugged lad who had many friends and a convincing manner of talking. A former principal once recalled: "Bob Saunders was no shirker. He was an honest upright boy who

always made his grades and was a good sport."

#### **Admirer of Abraham Lincoln**

His capacity to work hard and tirelessly manifested itself in his days at Oakwood Collegiate. Before going to school, he sold morning newspapers on the street corners and at one time handled as many as three paper delivery routes. His speech-making prowess became evident in his collegiate days when he won a gold medal for oratory. His subject was Abraham Lincoln, whom he has referred to as "my great hero." More than 30 year later, he repeated excerpts from that speech when addressing audiences in the United States to illustrate the breadth of curriculum in Canadian secondary schools.

Following graduation from Oakwood, he entered Osgoode Hall and was called to the Ontario Bar in 1927. Through out his education, he always had time to participate in several sports. As a rugby player, he was a valuable asset to teams from Oakwood, Osgoode and the Toronto Canoe Club. His ability as a canoeist won him a place on the

Toronto Canoe Club's paddling team from 1923 to 1928, while from 1929 to 1931 he coached the team. So eager was he to be a success in these fields that it was not uncommon for him to rise early enough in the morning to complete his paper routes before heading to the waterfront for paddling practice.

He was known for his firm loyalty, a virtue which he exhibited at all times. His fondness for Toronto was no exception. While on his first job after graduation, with the Canadian Bank of Commerce, his work threatened to take him out of town. Rather than leave Toronto, he resigned his position to enter a law partnership with E. J. Murphy, a relationship which lasted from 1928 to 1948. In 1944, he was honored by being created a King's Counsel.

Three years after graduation from Osgoode, Robert Saunders married Marjorie Fullerton Rennie, a girl he had known since public school days. They had one daughter, Marjorie, whom he affectionately called "Mardi." Despite all his activity, his family was a very

*(Continued on page 4)*





ON JULY 22, 1954, some 650 friends and colleagues of Mr. Saunders attended a dinner in Toronto arranged by the Ontario Municipal Electric Association in recognition of his untiring public service. He was presented with an illuminated scroll and boat as tokens of esteem.



DISCHARGING a self-imposed obligation, the late Hydro Chairman made frequent public reports on all phases of Hydro operations.

important part of his life. It was symbolic of his devotion that he always took time from his pressing duties to prepare his daughter's school lunch before going to work.

In 1935, he stepped from the comparative quiet of private legal practice into the stormy atmosphere of public office, when he was elected as an alderman to represent Ward 4 on Toronto City Council. He then moved up to Board of Control where he served four years. In 1945 his outstanding services to his native city were suitably recognized by his election as Mayor. On three successive occasions the Toronto electors expressed their approval of Mr. Saunders as Chief Magistrate. In the 1946 elections he was returned to the city's highest post by acclamation. In one of his inaugural speeches, he was moved to remark:

"When it is considered that one who has sold papers on the street corners, one who has delivered papers from house to house, who has acted as a truck driver and as a factory worker, and in almost every conceivable walk of life, becomes mayor of the second largest city—and a city we like to think of as the greatest city—in Canada, then I believe we can see the great advantage of democracy."

His flare for public relations and organization won him many friends. He

had an approach which gained him public recognition as an outstanding leader. No finer tribute was accorded him than in 1948 when the citizens of Toronto gave him the largest majority and the greatest number of votes ever recorded by a city mayor, a record which still stands. His outstanding services to Toronto and Canada during World War II were signally recognized in 1946 when he was made a Commander of the Order of the British Empire. He was presented with the Cross of Lorraine by the Government of France also.

His fourth term as Mayor ended a few weeks after the election. On March 1, he walked into Ontario Hydro's Head Office on University Avenue to become the Commission's sixth Chairman at the age of 44.

Hydro, at that time, was confronted with a critical power shortage. Dry weather of the previous summer, and an early winter freeze-up, combined with unprecedented power demands resulting from the immense economic and industrial expansion in Ontario presented an immediate challenge to the new chairman. With characteristic vigor and forcefulness, Mr. Saunders faced squarely to the task of implementing the recommendations of the Commission's engineers to increase Ontario Hydro's power resources. Conscious of

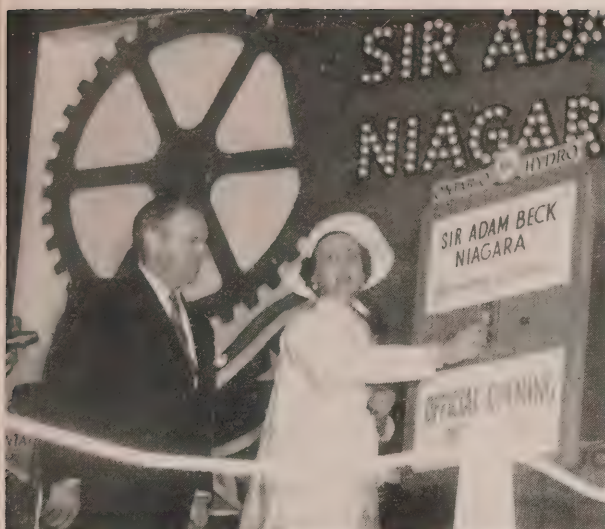
the necessity of gaining a complete understanding of the Commission's operations, he also undertook, during the next few months, a detailed study of every phase of Hydro activity. At nights, when the Commission's Head Office was quiet, the new Chairman could be found poring over annual reports and blueprints with top engineers.

His capacity to remember even the smallest of details about the Commission astounded his public at all times. He could quote Hydro statistics of every description on a moment's notice. The enthusiasm which he displayed for Hydro once prompted a Toronto newspaper cartoonist to refer to him as "Kilowatt Bob."

A few weeks after his appointment, Robert H. Saunders began making radio reports to the people of Ontario, a practice which he had started as Mayor of Toronto, and one which he continued until his fatal accident. His broadcasts began with the words which soon became a familiar trademark: "Good evening, ladies and gentlemen, girls and boys of Ontario, this is your Hydro Chairman, Robert H. Saunders, again reporting to you, the people I have the honor and privilege to serve."

If Robert Saunders had a creed where Hydro was concerned, it was based upon the Commission's motto: *Dona Naturae Pro Populo Sunt*—The Gifts of Nature





ON AUGUST 30 last year, Mr. Saunders watched proudly as The Duchess of Kent officially placed the first three units in service at the Sir Adam Beck-Niagara Generating Station No. 2.



TERMING it "a proud moment" in Canadian history, he participated in the St. Lawrence sod-turning ceremonies with Governor Thomas E. Dewey, left, and Ontario's Premier Leslie M. Frost.

are for the People. Imbued with this belief, he determined that Hydro would harness Nature's gift of water resources to serve the electrical needs of a power-hungry province.

With his sights clearly set, Mr. Saunders charged the Commission's engineers with accelerating the expansion program already underway, and pressed for a start on new projects. All the while, however, he kept a watchful eye on the progress of negotiations for the St. Lawrence Power Project, travelling to Ottawa and Washington to urge its approval whenever the opportunity presented itself.

#### International Negotiations

Although he recognized the need for power from the St. Lawrence, he realized the many barriers which would have to be overcome and the years which might pass before final authorization was obtained. Having dedicated his energy to protecting the people of Ontario against power shortages, he sought other avenues through which additional supplies of electrical energy could be obtained. This desire plunged him headlong into international negotiations for the redevelopment of power from the Niagara River.

His efforts in this field paid important dividends. In 1950, Canada and the United States ratified the Niagara Diver-

sion Treaty which provided for the enhancement of the scenic beauty of Niagara Falls, while permitting the most effective use of the Niagara River waters for power production purposes. The immediate effect of this treaty was to enable Hydro to start construction in December, 1950, on its greatest hydro-electric power development, the Sir Adam Beck-Niagara Generating Station No. 2, a project which will have an ultimate installed capacity of 1,828,000 horsepower.

As this and other hydro-electric giants throughout Ontario were being built, the Hydro Chairman kept his engineers investigating every other possible source of electricity. Armed with their findings, he gained permission from the Canadian Government for the diversion of additional quantities of water from the Welland Canal to increase the output of DeCew Falls Generating Station. In later years, he led negotiations for the establishment of interconnections for the exchange of power with two United States power companies.

The loyalty he had always held towards Toronto projected itself to encompass all of Ontario whose economy he considered vital to the greatness of Canada. He was, therefore, just as concerned about providing power for the province's industries as he was for the men who produced from the soil. Deter-

mined that the farmer should enjoy the same benefits from electricity as the urban dweller, Robert Saunders urged continued expansion of Hydro's rural service. Today nine out of 10 farms in Ontario are electrified.

The smaller communities in the province also received his personal interest and attention. Many villages and towns obtained their first Hydro power during his term of office. As a result of his efforts on their behalf, the residents honored him on numerous occasions. Among his most cherished possessions were two Indian headdresses which he received at the time he was made an Honorary Indian Chief at both the Wikwemikong (Manitoulin Island) and Christian Island (Georgian Bay) Reservations after the two reservations were supplied with power from Ontario Hydro for the first time. The Indian names he was given were appropriate: The Chief who brings Powerful Lights and Chief of the Far Reaching Lights.

Mr. Saunders always spoke of Ontario Hydro as one of Canada's greatest institutions and he was particularly proud when Hydro was called upon to assist in an emergency. Such was the case in the Fall of 1954 when Hurricane Hazel and the ensuing floods wrought such terrific damage in Ontario. When Hydro was

(Continued on page 17)



# PATHWAYS

## CHAPTER 1 (Part 2)

### SOURCES OF POWER

*(In Part 1 of this chapter which appeared in the January issue, a general review of study considerations required for determination of power potential in a river was presented. The Editor.)*

**I**N CONSIDERING actual development of potential power, it is necessary to obtain sufficient information at each of the various possible sites through which a portion of the total head could be concentrated to provide for its general design and estimate; subsequent consideration of alternative combinations of these successive concentrations determines the best overall pattern of development of the total potential power in the river.

This site information includes topographical, geological, hydrometric, forest and property data. Normally, this information is secured and studied in successive stages. Each stage refines the detail provided by the preceding stage as follows: Office Study of Available Data; Field Reconnaissance; Preliminary Alternative Layouts and Estimates; Field Site Investigation; Preliminary Design and Estimate; Selection of Sites.

Following the selection of the sites that will provide the best pattern of development of the potential power, the investigations and studies continue through to final design and construction.

In the course of these successive stages of investigation, certain field techniques are applied in obtaining the various forms of information required. A description of some of these techniques is now presented, followed by an outline of the stages of the field investigations in which they are applied.

**Photogrammetry:** Photogrammetry is a relatively new mapping technique in which aerial photographs are viewed

through special equipment to present to the eye, in a miniature scale, the conditions as they actually exist.


Aerial photographs are taken in progressive sequence along the line of flight of an airplane. The exposures are carefully timed so that the area covered by each photograph overlaps by about 60 percent the cover of the previous photograph. When viewed singly, with proper scale adjustments, such photographs provide a complete and relatively accurate picture of the area covered. An enlarged image of the photograph, projected on a tracing screen, can be copied directly to provide a map of the area. When two successive photographs, placed side by side, are viewed simultaneously by stereoscopic methods, the overlapping area common to each photograph assumes an apparently three-dimensional form. Hills and buildings, rivers and waterfalls appear as miniature models of the actual features, so that by using special equipment, topographical contour plans of the area can be drawn. These plans provide a broad general picture of the area for preliminary overall review.

To produce accurate maps and contour plans from aerial photographs, it is necessary to know the relative ground positions of a few specific points in the photographs. These are known as ground control points and are established by ground survey measurements. The measured elevations and distances between the various points are then applied to the photographic images as adjustment references in producing the actual plans.

For securing the photogrammetric ground control framework, elevations of reference points are often obtained by the use of two barometer sets. One set is placed to indicate the atmospheric pressure at a "base" point of known elevation. The second or "roving" set is carried to a point for which the elevation is desired and a reading taken of the atmospheric pressure at that point. The difference in pressure between these points is almost directly proportional to the elevation difference, which can, with proper adjustments, be computed. This barometric method of securing elevations of scattered points, although not precise, is often sufficiently accurate for the purpose and has the advantages of simplicity, speed and economy.

**Ground Topographic Surveying:** After review of the preliminary photogrammetric plans, ground surveys of specific

*(Continued on page 8)*



**AIR transportation saves many weary hours of "foot-slogging" for Commission survey crews in travelling to remote power sites.**





# TO POWER

By E. G. Tallman, B.A.Sc., C.E., and J. O. Gorman, B.A.Sc., M.M.E., Generation Department

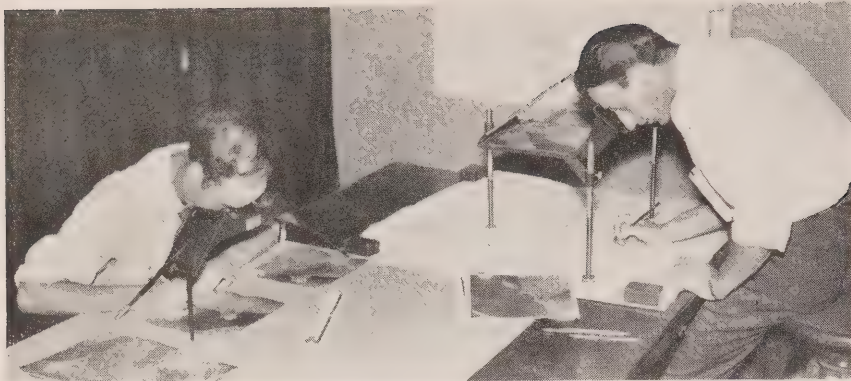


DIAMOND drilling forms part of a detailed geological investigation undertaken prior to the design and construction of a development.

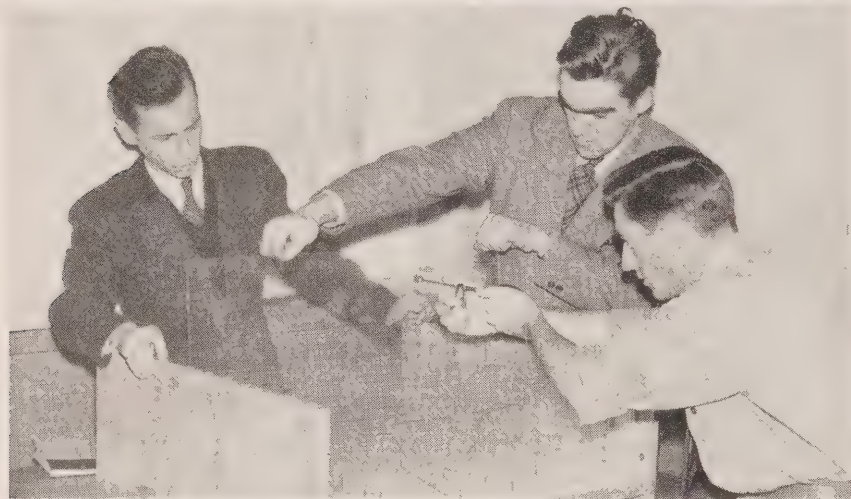


GROUND survey party pitches camp on the Mattagami River in Northern Ontario while obtaining information on a possible site.





BY MEANS of a stereoscope (left), and a sketchmaster (right), form-line drawings of the topography of a specific area are prepared from field data and aerial photos.



RIVER bed soundings and flow measurements are obtained from boats or canoes in quiet water. Near rapids or falls soundings are usually taken by overhead cable.



IN HYDRO'S Geology and Soil Mechanics Section, a sectional model of the rock formations in the vicinity of a proposed power site in northern Ontario is being set up.

areas proceed. Included in the varied information required for one design of power developments are detailed descriptions of topographical conditions over the localized areas of the proposed sites. This topography is reproduced and presented for office design use by drawing up contour map plans of the areas concerned. Variations in the elevation of the ground surface are indicated by contours—a series of continuous lines in the plans, each following a specific elevation existing on the ground. The plans must illustrate, in proper detail, the areas where structures may be required in the proposed scheme of development. These include sites for dams, powerhouses, headworks, canals, penstocks or pipe lines, colony sites for the operating staff and their families, access roads, and lands to be flooded.

Precise, detailed information for the production of these plans must be secured by careful ground surveys of these localized areas. The relative elevations and positions of many individual points in the area are determined by appropriate

use of the various instruments and devices commonly available to the topographical surveyor.

Distances and angular positions between the various points are measured directly by graduated tapes and surveyors' transits or indirectly by the "stadia" method. In this, the surveyor positions a specially-spaced pair of horizontal reference lines, set across the line of sight of his transit, to be superimposed across the graduations of a staff held on the spot to which the distance is required. The length of rod intercepted between these lines is directly proportional to the distance. By using the "stadia" method for securing topographical data, the elevations and positions of many points surrounding a transit "set-up" station by trigonometrical calculation are rapidly secured.

*Soundings:* River bed soundings are required at the locations where structures might be built or channels enlarged. In quiet water, these soundings are obtained directly from canoes or boats, using weights on graduated cables or by sonic

sounding methods. Here, electronic sounding equipment may be used. This is installed in the boat and transmits a sharp sound-wave impulse down through the water to the river bottom and records graphically on a continuous roll the time required for the return of the echo. The time interval corresponds to the depth of water and information is supplied in the form of a profile of the bottom along the line travelled.

Dams are usually built at or near the crest of rapids or falls. Close approach is usually too dangerous for boats, and soundings are customarily taken from shore by lowering a weight into the fast water from an overhead cable stretched across the rapids. This weight is attached to a thin wire rope passing through a pulley hanging from the overhead cable to the shore. The distance of drop, corresponding to the water depth, is measured on a graduated winch mounted on the river bank. These individual soundings are plotted to supply a contour plan of the river bed. In certain cases, a hovering helicopter has been used as a





means of suspension of the sounding weight and wire.

**Geological Investigations:** Engineering structures, such as dams, tunnels, canals or powerhouses, can be no better than the foundations upon which they rest and the materials of which they are built.

Hydro structures are custom-made. They are adapted by the engineers, through appropriate design and construction, to existing terrain and topography, surface and ground water, and other geological conditions at the construction site.

For this reason, many of the problems faced by the engineer in his consideration of the location, design, construction and operation of the structures are of a geological nature. To solve these problems, a detailed geological investigation under the direction of a trained engineering geologist, is required.

The geological investigations vary as widely as the geological conditions and their relationship to the proposed structures, with variant conditions, necessitating different exploration techniques to obtain the information required by the

design engineer to ensure sound, economic site selection.

Some of the principal questions that present themselves during these geological investigations may be summed up as follows:

Is competent foundation rock available at a reasonable depth? Will foundation grouting be required to ensure watertightness? Are the soil banks of the proposed reservoir sufficiently watertight to impound the water safely at the proposed higher water level—if not, is impervious material available to seal the slopes? Which rock strata are suitable for tunnelling? Will gas and water be encountered during the tunnelling operations? What limits will the soil at the site set on the stability of earth slopes? How will ground water conditions, changed by the higher water levels, affect this stability?

In order to answer these questions and many others, the ground surface must be mapped to locate and classify all the rock and soil types exposed. Subsurface investigations must be performed by

wash borings, diamond drilling, geophysical methods, test pits, and in some cases even by shafts and tunnels in rock and soil, to determine the depth to solid rock, the nature of the soil and rock, the continuity of the geological structure, and the ground water conditions. Suitable samples must be obtained to permit laboratory testing of the various properties of the soil, rock, water or gas.

In the performance of these investigations all the technical aids and implementations of the related sciences must be available if the information required by the design and construction engineers is to be assembled completely, clearly, and quantitatively.

#### Investigation Sequence

**Reconnaissance Stage:** Prior to the dispatch of a ground reconnaissance party to the river where a new power development is planned, a methodical office review of all available information is made. This includes data on basic local elevations, geological reports, patented land and mining claims, power rights, proper

(Continued on page 21)



# IT'S DONE AT DUNNVILLE

Pace-setting public utilities commission and staff win  
recognition for their unique Hydro and water  
services developments to serve growing community

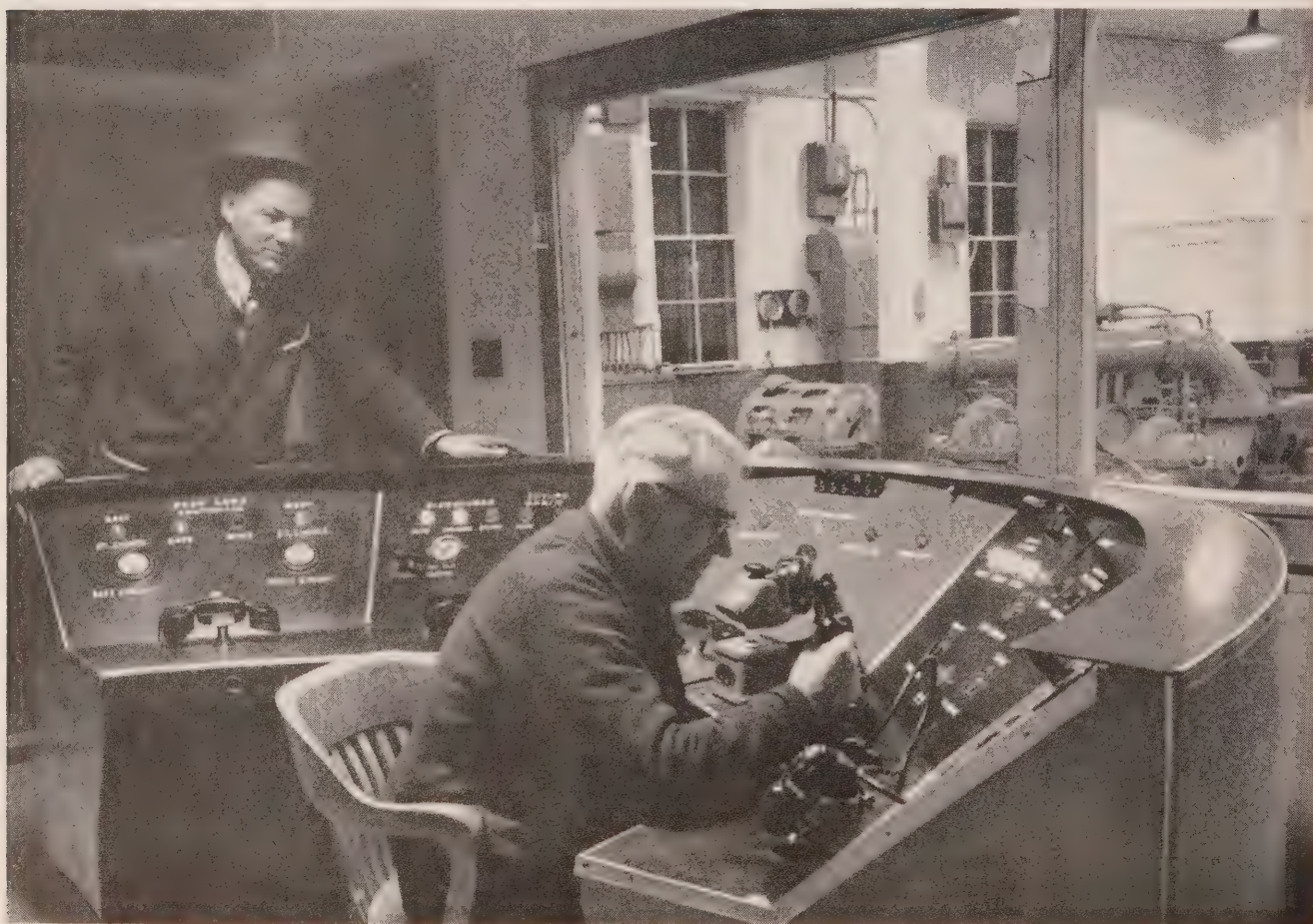
by Horace Brown

MANAGER John Dawson, left, watches Dan McCarey at the unique panel which controls the town's Hydro and water facilities. The panel also is used to transmit messages to the utility's radio-equipped maintenance trucks and to take calls for the local police and fire departments.

**D**UNNVILLE, largest town in the predominantly agricultural County of Haldimand, is a living example of how a progressive Ontario community can be paced by a farsighted and energetic public utilities commission.

A precedent-setting housing project, the establishment of new industries, the co-ordination of public services for their most effective use, the maintenance of high standards for distributing power purchased from Ontario Hydro . . . all these have received the active backing of the Dunnville Public Utilities Commission, and energetic application by Manager John Dawson. With a staff of 12, Mr. Dawson has successfully kept a jump ahead of the demand for the local commission's services by ingenuity and resourcefulness in several instances.

"We have a most progressive commission," he said. "They are willing to let me experiment with new ideas and methods which have effected considerable savings, while enabling us to provide more efficient service."





Certainly new ideas and methods were needed electrically when Dunnville proposed to erect, in co-operation with the Central Mortgage and Housing Corporation, the first low-cost rental housing project in Canada subsidized by the federal, provincial and municipal governments. The project consisted of 25 homes of five and six rooms. Site of the project was a former swamp, described by some residents as "a community eyesore."

Monarch Knitting Company Ltd., one of Dunnville's larger industries, promoted the plan, with costs being borne equally between the Ontario and Canadian governments, while the municipality agreed to rebate a share of the taxes to both governments.

Today, the so-called "community eyesore" has been transformed into an attractive, residential street which has been named Elizabeth Crescent in honor of Canada's Queen. It has proven so successful that private builders undertook the construction of an additional 25 homes during 1954.

New homes mean new Hydro services for local utility commissions. The initial Dunnville housing project presented an interesting problem for Manager Dawson and his Hydro line crew, as plans called for the installation of underground distribution lines—an innovation for a low-cost rental housing program in Ontario. Undaunted, the energetic Dunnville manager, with no examples to guide him, decided that a set of precedents would have to be established. So, as he modestly recalls, "we just went ahead and put in the new service."

Of course, it wasn't just as simple as that—not by any means. Each street light was erected on a cast-concrete base, at street level, while the main feeders for the house services were brought above ground level inside each standard for connection to the house feeders. Plastic, U.S.E. (Underground Service Entrance) cable, single conductor, was used for each domestic service.

The individual lines were laid in trenches (running fanwise from the bot-

tom of the standards), three feet deep, on a bed of clean sand. The cost of trenching was reduced substantially by using the commission's ditching machine. In covering the trenches after laying the lines, the Dunnville line construction crew left an extra length of cable, indicated by a P.U.C. sticker above ground, to permit electrical contractors to make the connection with the house wiring.

When it came to the installation of two underground transformers to serve the new homes, Dawson had to do some more "head-scratching." Here, again no precedent or proven plan was available to guide him. The problem was complicated further by the fact that relays for the street lights and domestic, electric water heaters (each home is equipped with the latter) had to be buried.

To accommodate the transformers and relays, the Dunnville P.U.C. men designed and constructed a new type of transformer kiosk. This particular kiosk, believed to be unique in Canada, at least, consists of an underground, concrete frame—approximately eight feet long, four feet wide, and five feet deep—with a low, peaked cover or roof. The latter is bolted to the frame and is removable when repairs or other work are necessary. This specially-designed kiosk is inconspicuous as only a small portion of it is visible above ground level.

Visitors are amazed by the atmosphere of spaciousness around Elizabeth Crescent although the properties are only of average size. John Dawson claims, with ample justification no doubt, that this is due to the absence of poles and overhead Hydro lines along the picturesque street.

The only indications of Hydro service are the attractive, park-type lighting standards, equipped with 200-watt lamps and spaced at 95-foot intervals along both sides of the crescent and, of course, the increasing number of television aerials.

Commenting on the installation, Mr. Dawson reports that "we didn't use any more conductor than we would have for overhead lines." Worried about the ultimate cost at the outset, the Dunnville

*(Continued on page 12)*



JOHN Dawson, right, and two staff members, Foreman Jim Armstrong and Tom Bowden, demonstrate the effectiveness of Dunnville's specially-designed aerial ladder truck.



Commission was pleased to find that the price "for the whole job" was approximately only 10 percent or about \$590 more than would have been paid for overhead wiring. Remarkable, also is the fact that the operation required the services of only four staff members who handled this work in addition to their regular duties.

#### Favorable Features

Speaking of the favorable features of underground Hydro service for domestic customers, the young Dunnville manager places improved appearance, protection from storm damage and easy repair in the advantage column. Questioned about the possibility of domestic customers digging their lawns and cutting the lines, he said his lineman had, on one occasion, replaced a damaged conductor by

attaching a new line to the broken ends, and pulling it through underground between the lamp standard and the house.

Dunnville Hydro customers, he reports, have taken to the underground system with enthusiasm. Already other customers have asked for buried conductors. Between September and December last year, 43 new services were installed. Three new apartment buildings, a factory and a new supermarket are now served by underground feeders. Customers requesting this type of service are charged a modest 35 cents per running foot. The P.U.C. auditor has ascertained that this is the actual cost of installing this type of wiring, and the local commission is not desirous of making a profit where community improvement can be achieved.

The Dunnville utility manager also

points out that tree-trimming is reduced to a minimum with underground distribution. Dawson speaks with the "voice of experience" for Dunnville is a picturesque town with its many tree-lined streets. This presents something of a problem for the local Hydro linemen as 12 miles of Dunnville's 27 miles of distribution line are located on thoroughfares where the trees actually meet overhead.

Characteristic of Mr. Dawson and his line crew, they met this situation by designing a special type of aerial ladder truck—sometimes called a "sky-worker"—to fulfill their particular requirements. In the P.U.C. manager's machine shop, they overhauled the motor of a 1948, four-ton truck equipped with a special frame for hauling milk. Then they installed a new steel base for an aerial ladder and platform.

Three men can use the platform simultaneously at various heights ranging up to 26 feet above truck level. Electric saws for tree-trimming work are operated by means of clip cords connected to adjacent distribution lines. Equipped with a cable hoist, capable of lifting loads up to 2,000 lbs., the truck can be used for moving transformers and other heavy equipment, as well as effecting emergency or routine repairs to other overhead electrical facilities. Emergency power can be furnished, if necessary, by a five-horsepower, gasoline-operated generator installed on the truck.

"This truck embodies many of our inventions," Mr. Dawson states, and points



TRANSFORMER and relay kiosk for Dunnville's first underground distribution services has a removable covering which facilitates this repair job for Foreman Jim Armstrong.

THIS recently-completed Dunnville home is one of many now served by the local utility's growing underground distribution system.







**MEMBERS of the progressive Dunnville Public Utilities Commission, left to right: Commissioner W. H. Binns, Mayor F. J. Ramsey, Chairman C. G. Thomas, and Manager Dawson.**

out that much of the equipment was purchased from Ontario Hydro's Surplus Materials Department.

#### **Control Panel**

Another Dunnville innovation is a compact control panel in the local water pumping station. Designed and built by the local P.U.C. staff, the panel is in charge of a "shift" staff, and controls operation of the Dunnville Hydro substation and water supply facilities. In addition, the operator on duty takes all police and fire department calls as well as maintaining communication with the utility's three-way radio-equipped trucks. Much of the equipment in this unique panel, as well as all switches and motors for the water-pumping equipment, was surplus material also purchased from Ontario Hydro. The waterworks system uses 50-, 75-, and 125-horsepower electric motors for high-pressure pumping, and 10- and 25- and 40-horsepower motors for low-pressure purposes.

The waterworks division of Dunnville P.U.C. also rates prominent mention. The town claims the distinction of being the first in Ontario to pioneer in the use of plastic service pipes and cement-concrete mains. From a daily water consumption of 5,000 gallons a day 20 years ago, the town has increased its daily consumption to figures ranging between 750,000 and 1,000,000 gallons. Municipal officials are now considering the feasibility of bringing water from Lake Erie—a distance of five miles.

Beside such modern methods of operation as three-way radio communication, the electrically-operated aerial ladder, and the novel control panel for co-ordination of public services, John Dawson has initiated the use of maps for his small but efficient Hydro line crew. Working from a survey map of the town, Dawson has plotted the location of each transformer in the municipality. With a copying machine, duplicates of the master system map have been made available to line staff members. Any changes in transformer location or the installation of additional equipment are recorded on the master map. New duplicates are made for the use of the line staff and the old copies are destroyed.

When a customer reports electrical trouble on a specific street, the linemen consult a cross-index file which contains information about the transformer supplying the house reporting the power failure, the primary circuits feeding the transformer in question, all secondary feeders, and the phase of the house-wiring concerned. Thus, the men of Dunnville P.U.C. know where they're going and what is required when they set out to remedy an electrical fault.

With foresight, initiative, and inventiveness like this, John Dawson has been able to weld his small Hydro force into a unit that not only serves the 1,900 or more Hydro customers efficiently, but leads the way in the phenomenal growth of the municipality.

In 1954, Dunnville joined the ranks of dual-cycle municipalities, by building a new 60-cycle substation to co-operate with Ontario Hydro's plan for supplying 60-cycle power to new industries and other classes of customers in advance of regular frequency standardization operations.

Although general cutover to the higher frequency will not be completed until 1958, Dunnville can now supply power at either frequency to any class of customer. Already several local factories and homes, as well as street lighting on some thoroughfares and the utility's pumphouse have been changed over to 60-cycle power.

The building of the new substation further consolidated the reputation of the local P.U.C. staff for completing special projects on schedule.

Actual construction of the \$75,000 plant was handled entirely by the Dunnville staff, which also originated all designs and working plans, in a matter of 12 weeks.

At the same time, this Hydro staff was continuing with the four-year program of rebuilding the town's entire electrical distribution system, destined for completion this year.

#### **Load Growth**

Such a program is dictated by the rapid growth of electrical consumption among Dunnville customers.

*(Continued on page 11)*



Completion of important projects, which perpetuate the memory of the late Robert H. Saunders, must be Hydro's immediate objective, Dr. Richard L. Hearn, new Commission Chairman, tells O.M.E.A. audiences



🏠 O.M.E.A. President Lt. Col. A. A. Kennedy, left, extends congratulations to Hydro's new Chairman, Dr. Richard L. Hearn.

# LOOL

**I**N HIS first public appearance as Chairman of Ontario Hydro, Dr. Richard L. Hearn told the annual meeting of District 7, O.M.E.A., at London on January 25 that the immediate job ahead of the Commission staff and the participating municipalities was to carry out the work so ably started by the late Robert H. Saunders.

Paying tribute to the former Chairman's memory, Dr. Hearn said he had accepted his new post with the firm conviction that it was his duty to continue the large-scale expansion of Hydro's facilities inaugurated during Mr. Saunders' chairmanship.

The speaker reminded the delegates that conditions in Ontario are changing rapidly, "and we must plan, as he planned—for the future. I am sure," he added, "that we can succeed in our task with the help of the spirit of team-play which my revered predecessor im-  
bued in all of us."

In a review of current Hydro developments, Dr. Hearn said that the Niagara project was well underway and that the St. Lawrence Project would be moving in "high gear" by spring. Turning to atomic power, the new Chairman, who is a Director of Atomic Energy of Canada Limited, stated that the question of building the first reactor in Canada is still to be decided.

"Britain and the United States hope to have reactors in the next two or three years. By that time, the St. Lawrence may be finished and we may be in a position to decide whether Hydro should go ahead with atomic power or the development of power in other ways."

A. W. Manby, Hydro's newly-appointed General Manager, paid tribute to the



◀ **DISTRICT 7 O.M.E.A. officers,** front row, left to right: Gordon Fraser, Parkhill; Stewart Killingsworth, London, President; W. F. Craig, Woodstock; standing, from left: P. R. Locke, St. Thomas; V. A. McKillop, London; H. R. Henderson, Woodstock, and J. A. Bowman, Ingersoll.

🏠 **DISTRICT delegates,** left to right: W. H. Hull and George Walker, Dutton, and Bruce Grant, Gran-  
ton discuss problems.





# ING AHEAD

Commission staff whose loyalty, he said, was a great source of encouragement for the task that lay ahead.

"It is my aim to give effect to the policy so often expressed by our late Chairman—to see that the greatest amount of power is available to the people of Ontario at the lowest possible cost consistent with sound economy."

Mr. Manby spoke highly of the job being done by construction men at the Sir Adam Beck-Niagara Generating Station No. 2 project, calling it a magnificent effort that enabled Hydro to meet the peak period demands of the past year. After the St. Lawrence, additional power would probably come from thermal sources. "Whether it will be nuclear, coal or oil, we can't say at this time . . . but we look forward to the future with confidence."

At the outset of the meeting, a period of silence was observed in memory of the late Chairman, following which a moving tribute was paid by J. W. Peart, General Manager, St. Thomas P.U.C.

Mr. Peart described Mr. Saunders as "a great public servant, and a great Canadian, who went to a great deal of trouble to pass on information concerning Hydro to the public."

## Pattern of Leadership

"In recognition of the late Chairman's efforts to promote the interests of Hydro," said Mr. Peart, "we should take a page from his book and follow the pattern of leadership he provided so well for all too brief a period."

W. Ross Strike, Q.C., Second Vice-Chairman, added a brief eulogy, observing that the late Chairman had made a great contribution, not only to Ontario, but to all of Canada. "Now," added Mr. Strike, "we have the memory of a great Canadian as a tradition in our Hydro family."

Mr. Strike also commended Dr. Hearn for putting aside his private plans to assume the Chairman's role in Hydro affairs. Referring to the late Mr. Saunders as "the man who put us in the enviable position where we soon will have reserves on our hands," the speaker said that Hydro now faced the job of consolidating its position to give the best possible service. He expressed confidence that Hydro would receive the support of all municipalities.

Other speakers included O.M.E.A. President Lt.-Col. A. A. Kennedy, who said he knew that he was expressing the thoughts of all present in declaring that the appointment of Dr. Hearn as Chairman merited the approval of all municipalities throughout the province.

Concluding, Lt. Col. Kennedy said that O.M.E.A. members as a group "must continually be critical of Hydro, and also critical of ourselves, if we are to best serve the cause of Hydro in Ontario."

Climaxing the meeting, J. Stewart Killingsworth, of London, was elected President of the district association for 1955, with the following executive: 1st Vice-President, W. F. Craig, Woodstock; 2nd Vice-President, Gordon Fraser, Parkhill; Directors, P. R. Locke, St. Thomas; V. A. McKillop, London; H. R. Henderson, Woodstock, and J. A. Bowman, Ingersoll.—*by J. G. Murphy.*

## DISTRICT 4 O.M.E.A.

Receiving a similar enthusiastic greeting from delegates at the annual meeting of District 4 O.M.E.A. in Toronto on January 27, Dr. Hearn reiterated his intention of pressing forward with construction at Niagara and the St. Lawrence Power Project, both of which will perpetuate the memory of the late Robert Saunders.

"We must complete these important developments and whip our organization

into the most efficient utility in the world. That is the ambition of the other two Commissioners and myself, with the help of our efficient staff."

Dr. Hearn said that he came to the meeting with a rather sad heart, because of the untimely death of Mr. Saunders. Yet, he was happy in respect to the fact that the Commission found itself in a position to carry on the projects initiated under the late Chairman.

Speaking highly of A. W. Manby, General Manager, and Dr. Otto Holden, Chief Engineer, the Hydro Chairman outlined the accomplishments of Hydro in the past year, with particular reference to the outstanding progress made on Sir Adam Beck-Niagara Generating Station No. 2.

"Seven units were placed in service last year. That, I think, is a very creditable achievement. Another five units will come in this year, and the pumped-storage will be in operation in the Fall of '56. The remaining four units will not be put in until after the completion of the St. Lawrence."

The St. Lawrence Power Project would be well underway this year. The speaker also referred to the extension to the Pine Portage Generating Station and the new Manitou Project on the English River. Reaffirming Hydro's position on the subject of power from atomic sources (see report of District 7 O.M.E.A. above), Dr. Hearn said:

"This is the first year since the end of World War II that Hydro will have an adequate reserve in the system. There is no foreseeable reason why we should again, find ourselves in the unfortunate position of a few years ago, when we had to say to our customers that we had not sufficient power to serve them."

A spirited panel discussion dealing with the future of local commissions in the

(Continued on page 16)



**MEMBERS** of the new District 4 executive including, left to right: J. A. Orr, North York; A. H. Waites, Mimico; Dr. V. S. Wilson, Etobicoke Township; W. E. Wright, President, Toronto Township; Bert Merson and D. G. Moffitt, Toronto; W. P. Dale, Brampton, and C. J. Ellerbeck, East York, in session.



**DISTRICT 4** delegates, left to right, G. D. Pattinson, Toronto Township; Harry Bush, A. H. Waites, D. B. Michie, Mimico, and S. R. Greenwood, Weston, discuss the program.

Metropolitan Toronto area provided one of the highlights of the meeting. With W. Ross Strike, Q.C., 2nd Vice-Chairman of Ontario Hydro, as moderator, members of the panel which included Mrs. Marie Curtis, Reeve of Etobicoke; O. E. Crockford, Reeve of Scarborough Township; C. O. Bick, Reeve of Forest Hill, and H. B. Lofquist, a member of Oakville's Public Utilities Commission, took a different aspect of the subject and pursued it vigorously.

Reeve Bick provided ammunition for

a lively debate when he discussed the question of employee relations and the right of public utilities employees to strike.

"We might aim for the same law that applies to police and fire department employees who are not permitted to strike. I don't think either policemen or firemen have been hurt by the legislation. I have found that employee relations are improved when employees feel you are interested in their problems, whether you agree or disagree with them, and they

are confident that they will receive a sympathetic hearing."

Rising to agree with Mr. Bick, Mayor W. A. Edwards, of Mimico, blamed part of the present high tax structure in Ontario on pyramiding wage demands. Lt. Col. A. A. Kennedy, President of the O.M.E.A., expressed his disagreement with the proposal that the right of public utility employees to strike be limited.

"As an employer," he said, "I was at first greatly in favor of the motion that came before the O.M.E.A. to ban strikes in public utilities. Fortunately we had several good labor men on our board, who were able to set us straight. Ontario Hydro has excellent labor relations, and I think we can learn from it. I have found that labor generally is just as reasonable as you or I."

Bertram Merson, Chairman of Toronto Hydro, who had spoken earlier on the Municipal Hydro-Electric Pension and Insurance Plan now available to the municipal employees and pointed out that a number of commissions had not yet joined the Plan, outlined his lengthy association with labor.

"What service being rendered to man today is *not* essential?" he asked. "Even our so-called 'luxury services,' like theatres, are essential. Where is it going to end, if you ban strikes for public utilities employees? As you expand the list of these essential services, you push the trade union movement back. The firefighters' association has a 'no-strike' clause written right into its constitution."

The delegates evinced keen interest in a showing of the new Ontario Hydro film, "The Powerful Horseshoe," dealing with the construction of the Niagara project.

In his opening remarks, President W. Elmer Wright stressed the importance of continuing to press for the development of new sources of power on a co-operative basis.

#### O.M.E.A. Representation

Discussing O.M.E.A. representation in Ontario Hydro at Commission level, Mr. Wright said that "no other corporation with a capitalization equal to Ontario Hydro operates with a Board of Directors of three." He felt the Commission should be increased to five members, two of whom should be O.M.E.A. representatives.

Extending congratulations to Dr. Hearn on his appointment as Ontario Hydro Chairman, Mr. Wright also expressed regret "in the loss of our former Chairman and friend."—by Horace Brown. •



# LIFE'S WORK WELL DONE

(Continued from page 5)

asked if it could help, he spoke the now-famous words: "If we have it, take it." As a result, the Commission's resources—its helicopters, Bailey bridge material, pumping equipment and men—were placed at the disposal of flood and rescue workers.

## President of C.N.E.

In spite of his heavy Hydro schedule, Mr. Saunders found time to contribute towards another great Canadian institution, the Canadian National Exhibition. In 1945, he was made a Director and in 1954 was named its President. His lifelong interest in sports found an outlet in the C.N.E. Sports Committee and in the development of Canadian prospects for the Olympic Games. He was Canada's representative on the International Olympic Committee and had travelled to Europe in an attempt to bring the games to Toronto.

Mr. Saunders once said that "only if you have worked hard, can you play hard." A favorite form of relaxation was to spend Saturday night in the kitchen practicing his hobby—cooking! It was not unusual for him to stay up until two o'clock in the morning at the stove. And strangely enough, by his own ad-

mission, many of his best ideas for Hydro came to him while he was cooking.

It seemed that as each year passed, the St. Lawrence Power Project moved just a few paces closer. It was ever prominent in the late Chairman's mind and he rarely missed an opportunity to speak of it and for it. In communities across the province he could be heard extolling the great need for power from this mighty waterway. At exhibitions where a Hydro model of the proposed project was on display, he would personally describe the method of harnessing the river for the production of power.

On June 7, 1954, he witnessed the culmination of his work and of countless others who had worked before him and beside him to make the St. Lawrence Power Project a reality. On that historic day, he said: "Without question, I am the happiest man on the North American continent, if not in the world." The last obstacle had been removed and it was now possible to commence construction of the development. Only two months later, he was present when the first sod was turned at international ceremonies on both sides of the St. Lawrence River.

## Looking Ahead

But even with the St. Lawrence an accomplished fact, this eminent citizen did not slacken his efforts to ensure On-

tario of adequate future supplies of power. He was in the forefront of the development of electricity from atomic sources. Last year he was appointed a member of the Advisory Committee on Atomic Power Development and went to England to study experimental plans there.

Throughout his years at Hydro, he was always conscious of the part played by Canadian engineers and builders in the construction of the Commission's immense power plants. At his instigation, Hydro adopted a policy of naming several of its generating stations in honor of prominent Canadian engineers.

It was, therefore, a tribute to the man, Robert Hood Saunders, when the Ontario Municipal Electric Association last July suggested that Ontario Hydro's St. Lawrence Generating Station be named in his honor. In doing so, the O.M.E.A. presented him with an illuminated address which expressed the "warm appreciation of the people of Ontario, in recognition of the complete and untiring public service you have rendered as Hydro Chairman from the time of your appointment on March 1, 1948.

"Especially do we associate your dynamic personality with the resolution of the great St. Lawrence Power Project and the pre-eminent role you have played in making this dream of Canadians for half a century an ultimate reality."

CHIEF Leonard Monague, Christian Island, conferred the honorary title of "Chief of the Far Reaching Lights" on Mr. Saunders after he inaugurated Hydro service for the Georgian Bay Indian reservation last December.



HYDRO'S late Chairman with a tiny pupil of S.S. No. 10 Culross, Bruce County. He was instrumental in providing electric lights for his "adopted" rural school.



# 1911

## AND

# NOW

**Expansion of Commission's rural area facilities reflects dramatic changes since Sir Adam Beck first tried to sell electricity to the farmers of Ontario**

SIR ADAM BECK, the Commission's first Chairman, really started something when he set out to "sell" Hydro in the rural sections of Ontario.

The derision that greeted his first travelling "circus," around 1911, and how Sir Adam tenaciously overcame that skepticism to bring the benefits of electricity to Ontario farmers is a story in itself.

No one doubts that he succeeded, far and beyond even his own expectations.

At the end of January this year, for example, Ontario Hydro had a total of 391,682 rural customers served over a rural network of 42,577 miles of line.

The year 1954 saw important changes in several of the Commission's 105 rural operating areas throughout the province, particularly the acquisition or construction of new and larger quarters, which forcibly reflected the expansion of Hydro service and the healthy economic situation in rural Ontario.

This plan for providing up-to-date, standardized office and warehouse facilities for the Commission's rural operating areas actually was inaugurated in 1952.

The first of the new offices was completed late that year for Minden R.O.A. Since that time modern office structures have been built and are now occupied at Bracebridge, Perth, Richmond Hill, Stayner, Cayuga and Woodbridge.

Meanwhile prefabricated service buildings with aluminum siding have been provided at St. Thomas, Strathroy, Owen Sound, Cobourg, Peterborough, Cobden,



ONTARIO HYDRO NEWS



arnia, Bracebridge, Brantford, New Liskeard, Plantagenet, Richmond Hill, Stayner, Woodbridge, Mitchell, Guelph and Kitchener. A new, combined office and service building also has been completed and occupied at Bala.

During 1954 the staff of the London Area moved into larger, rented quarters to meet the increasing demands for Hydro service while new offices were underway at St. Catharines and Kitchener. At the same time work was underway on new area service buildings at Shelburne, Cayuga, Fenelon Falls and Brockville.

The Commission has approved construction of new offices at Shelburne and Brockville in 1955. Erection of new service buildings is scheduled at Kirkland Lake, Harrow, Lucan, Markham, Shelburne, and Clinton this year.

Hydro's streamlining program for its rural area offices took a novel turn at Woodbridge, recalling the legend of the fabulous phoenix bird of Egypt. This famous bird burned itself on a pyre at the end of its normal life span, but from its ashes a new and beautiful phoenix arose.

Similarly, Hydro, during 1954, created a new and attractive headquarters for Woodbridge R.O.A. from the remains of a public school, partially destroyed by fire in 1950.

By purchasing the building, in which Woodbridge students had studied since 1893 and renovating it according to the design and specifications of the Architectural and Building Department, the Commission achieved considerable economy, at the same time maintaining a landmark in a new form.

The rehabilitation of the fire-blackened building was a unique project. The damaged bell-tower and top floor, with the exception of a second-floor washroom annex, were removed. With a new roof, the lower floor was divided into one general office and two smaller offices. Walls were painted a pleasing peach shade while the floors were covered with

lino tiles. Provision for artificial lighting was made by installing fluorescent fixtures to supplement the natural lighting from the extra windows incorporated in the new design. Convenient public access to the converted structure has been facilitated by the construction of an imposing, modern entrance, and the provision of ample, off-the-street parking space.

### Radio-Equipped Trucks

Area Manager Lionel D. Pengelly, and his staff of 30, including line crew, forestry group, office staff, electrical inspector and storekeeper, are more than pleased with their new surroundings. A switchboard has been added for even more speedy handling of customer calls. Two trucks have been radio-equipped, and a third is destined for the same improvement.

The service building was erected by the area staff at the rear of the property,

and provides space for an office as well as five trucks and stores materials. Prefabricated material, similar to that used in the other buildings being erected by Hydro in the various areas mentioned above, was used in the Woodbridge service building, with a consequent saving in time and labor.

Indicating public reaction to the modernization program, Hydro's new Woodbridge headquarters was described as "a real ornament" for the expanding community by the *Woodbridge News* after an inspection of the renovated premises.

### New Office

From London, Ontario, comes another story of expansion of Hydro services in the thickly-populated area surrounding that city.

The London Area differs greatly from the majority of the Commission's rural areas since 80 percent of the total customers in the London Area might be

(Continued on page 20)

WOODBRIDGE R.O.A. staff recently moved into the attractive building below which was created from the remains of partially-burned school, right.

THIS school, in which Woodbridge pupils had studied since 1893, was damaged by fire in 1950. Hydro's "face-lifting" project involved removal of the damaged bell tower and top floor. The renovation work was completed in September, 1954.





**STREAMLINING** program to meet the demands of Hydro's rural customers has included the erection of several prefabricated service buildings such as this compact structure at Richmond Hill.



**TYPICAL** of the new design adopted for the Commission's rural offices is this compact and attractive building which serves as the headquarters for Hydro's Perth Rural Operating Area.

described as suburban domestic, rather than rural customers. In addition, the peak load of this area is today higher than many municipal Hydro systems in the province.

To take care of the rapid growth in recent years, the London area office has been moved to larger quarters at 280 York Street. The staff was formerly located at 202 King Street.

#### Thousandfold Increase

Manager A. F. Ferguson reports that the electrical load of the London Area was approximately 8 kilowatts in 1923, when the area was established (then known as London Rural Power District).

The number of customers served increased in 31 years from 66 to 10,500 in 1954. The maximum demand for power in the area, excluding the City of London, is now over 15,000 kilowatts, equal to the combined power demand of St. Thomas and Ingersoll. Although there are several hundred municipal Hydro systems in Ontario, only 22 have a larger maximum load than the London Area which provides service to most customers in Westminster and London Townships, either directly or through the Lambeth, as well as the Township of London Hydro Systems.

The new area office designed to accommodate a staff of 26 provides much

improved facilities for serving customers. Mr. Ferguson has emphasized consistently the importance of encouraging customers to discuss their service problems with the area staff, and as a convenience to customers, off-street parking space has been provided.

Records show that there were only 13 miles of power line in the area when it was established in 1923, and the staff consisted of the manager and one assistant. At the end of 1954, it required 340 miles of line to serve Ontario Hydro customers in the London Area, while a total staff of 120 was employed in all phases of this specific operation. The staff includes five line crews, each provided with a special truck, and two service men, driving light repair trucks. Since the lines must be kept clear of trees, a crew specializing in tree trimming is also required.

As well as maintaining lines, this area operates and maintains 14 transformer and substations, including the large E. V. Buchanan Transformer Station at Pond Mills. This work requires two station maintenance crews capable of maintaining and repairing many different types of apparatus. Repair and testing of meters requires a staff of four men and four men are employed in reading customers' meters and reporting the readings to the office staff.

Maintenance of trucks is done in the area and three qualified mechanics are employed in this work servicing 78 trucks, including some under the control of other areas.

The staff also includes six electrical inspectors who guard the public interests by ascertaining that all new electrical installations conform with regulations before they are placed in operation. They also investigate any accidents that involve electrical equipment. •





## PATHWAYS TO POWER

(Continued from page 9)

ties, transportation, and review of previous surveys in the area. Applying all available horizontal and vertical control (such as cut-out township lines and known water levels) to aerial photographs, a preliminary river profile contour plan of the area can be made to indicate tentatively the possible head concentrations and general scheme layouts. This plan furnishes an excellent guide for the subsequent field reconnaissance, during which its accuracy can be confirmed or corrected by the securing of certain additional specific ground control points.

Having completed the office review, a small field party travels through the area to secure a framework of key information to determine a general policy of development of the potential power. This party will include an engineer to observe and assess details on the ground as related to design requirements; a geologist to ascertain corresponding foundation and general land conditions; a photogrammetrist to obtain special ground control points, and a surveyor who will carry along a continuous line of elevations for reference water levels and photogrammetric control points, secure special profiles of possible dam sites, channel routes and soundings, and plant survey monuments for future reference. The tent camp is constantly moving along, and a guide who can turn his hand to short-order cooking is an essential addition to the party.

In the reconnaissance stage, a large number of possible sites may be examined to determine the most promising locations for structures and the kind of geological and engineering problems that different sites may be expected to impose.

The geological investigations in this stage are usually confined to geological mapping and surface sampling to ascertain the types of rock and soil, the structure and main weaknesses of the rock formations, ground water conditions, and the availability of suitable construction materials, such as gravel and sand for concrete aggregate, clay or other impervious material for earth dams, and road-building materials.

In many cases, undeveloped power sites are located remote from roads or railways. Travel to these sites must be by canoe or airplane, or, in the winter, by

snowmobile or motor toboggan. Bush planes are equipped to fly personnel, canoes, camp gear and supplies in to lakes located deep in the wilderness, with great savings of time, effort and efficiency. A special three-sectional survey-purpose boat, of aluminum-sheeted plywood has been designed and built by members of the Commission's staff. The boat sections, longitudinally divided, are of a size and weight to be flown individually into a remote area, there to be assembled as a safe and stable craft, capable of carrying several tons of cargo, of supporting a drilling outfit for underwater diamond drill investigations, and of transporting personnel safely across large, rough lakes.

Radio communication equipment is supplied to all remote survey groups, and is indispensable to the efficiency of operations.

The results of this field reconnaissance are interpreted and assembled by the field engineer and geologist in the form of drawings and reports for the use of the design engineer in his studies of preliminary layout and estimate.

### Preliminary Survey and Investigation

*Preliminary Survey and Investigation:* Engineering studies, based on the above reconnaissance information, narrow the choice of locations to the most promising sites. A complete field party is then sent to these sites to obtain sufficient additional information to clarify the engineering and geological problems.

An accurate framework of survey traverse stations is established and filled in with complete topographic detail by stadia methods. River soundings are obtained where necessary.

The geological mapping and search for construction materials, such as gravel, sand and clay, is continued.

In addition, the subsurface conditions are investigated by obtaining samples of the solid and rock from bore holes and test pits, to determine the stability and watertightness of the foundations materials.

The areas of lands to be flooded are delineated, using combined ground survey and photogrammetric procedures. Access road routes are located and colony housing sites selected and surveyed. Land surveys are made now or later, of all affected properties.

The information gathered during this phase of the field program is forwarded to the design engineer for use in semi-final design, cost estimates, and economic

studies. These will permit sound selection of the site or sites to be developed and the type of construction.

*Final Stage—Investigation for Construction:* Prior to the actual construction of the development, additional field information will be obtained in great detail where required, to permit final design and location of the various structures involved in the development. •

## DUNNVILLE

(Continued from page 13)

In four years, loads have increased 65 percent. Four years ago, the average monthly consumption per domestic customer was 108 kilowatthours. Today, the average monthly consumption for domestic customers is 154 kwrs.

"We believe in making the job as easy as possible for the staff," Dawson told Ontario Hydro *News* recently. Continuing, this former Ontario Hydro employee, who received much of his Hydro training with the Commission at London and Exeter, Ontario, says his aim is to make every operation as mechanical as possible.

Administered by a three-man commission consisting of Mayor Frank Ramsey Jr., and two elected Commissioners, C. G. Thomas and W. A. Binns, the electrical staff under Mr. Dawson includes Foreman James Armstrong, as well as Hugh Robins, Jerzy Kurowski, Thomas Bowden and Lorne Culp.

The waterworks staff is supervised by Fred Wiederick and consists of George Crumb, George Little, and four plant operators, Max Bloomfield, Daniel McCarey, John Mitchell and Raymond Shields.

They're the men who get things done at Dunnville—in the public utility field at least! •

### Named Chairman For Seventh Term

At the first meeting of the Woodbridge Hydro-Electric Commission, William Hollingshead was elected Chairman for 1955 for the seventh term. He and Clarence Graham have been members for 12 years, Mr. Graham having been Chairman from 1944 to 1948. Ed. W. Brown was again appointed Secretary-Treasurer for 1955. Mr. Brown has commenced his 41st year with the local commission, having been with them since its inception in 1915.







ONTARIO HYDRO

# News

MARCH, 1955



# ONTARIO HYDRO

# News

March, 1955

Vol. 42

No. 3

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620 UNIVERSITY AVENUE, TORONTO



## THREE ALTERNATIVES

ELSEWHERE in this issue the reader will note an article entitled "Approach to Nuclear Power." This article contains a report of an address given by Harold A. Smith, Ontario Hydro engineer, at the recent O.M.E.A.-A.M.E.U. convention in Toronto. Mr. Smith is the Project Co-ordinator of an 11-man Nuclear Power Group now studying the feasibility of nuclear-electric power development at the Chalk River plant of Atomic Energy of Canada Limited.

While Mr. Smith, for security reasons, was not in a position to divulge all of the engineering data assembled on this vital subject, his report contained a calm and reassuring appraisal of the progress made by the Nuclear Power Group which comprises Ontario Hydro engineers as well as representatives of several other noted Canadian engineering organizations. A perusal of his remarks will, we are confident, do much to allay the pessimism that exists in the minds of many people, and to assist those interested to make a realistic assessment of the possibilities and economy of developing power from nuclear sources.

In this connection, Mr. Smith said that numerous nuclear reactors have been constructed and have operated for periods up to 10 years. Some reactors have been adapted to demonstrate the production of electric power in very small amounts, others have been constructed for power production only in ratings up to 5 megawatts, and still others are in an advanced stage of construction in ratings up to 60 MW. Particularly significant was Mr. Smith's observation that "it is evident that this new source of power is, at least, potentially competitive with conventional thermo-electric sources for supplying future load growth in electric utility systems."

Of equal significance was the fact that Dr. Richard L. Hearn, the Commission's Chairman told delegates at the same convention that sufficient developments are now under construction to meet the province's power requirements until 1962.

Thereafter, the Commission will have the option of: (1) producing power at less accessible hydro-electric sites (2) using coal, oil or gas to produce steam-electric power near load centres, or (3) generating power by means of nuclear reactors. In addition to its participation in the feasibility studies at Chalk River, the Commission is keeping in close touch with nuclear development in Great Britain and the United States.

Thus, by keeping abreast of these experiments and studies in the field of nuclear-electric power at this early date, the Commission is leaving ample time for a full consideration of the relative merits of the three possible sources of power mentioned above. Acting upon the results of these considerations, Hydro can then proceed with the development of the source or sources of power which can best meet the necessary standards and, also, fulfill the province's power requirements of a decade or so hence.



RICHARD L. HEARN, D.Eng.  
Chairman

HON. GEORGE H. CHALLIES, M.L.A. 1st Vice-Chairman  
W. ROSS STRIKE, Q.C. 2nd Vice-Chairman

A. W. MANBY, B.Sc. General Manager  
OTTO HOLDEN, D.Eng. Chief Engineer

ERNEST B. EASSON  
Secretary

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Chairman

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H. A. HOWARD President, A.M.E.U.

A. W. MANBY, B.Sc. General Manager  
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## COVER PHOTOS

ON our front cover this month, C. K. Merner, New Hamburg (holding banner) surrounded by such Hydro veterans as, left to right, J. R. Pattison, Fort William; H. G. Fairman, Hastings; John Brown, Scarborough Township; N. R. Graham, Hagersville, and others, has his boutonniere straightened by a comely Royal York Hotel employee as he led them into the banquet hall to receive O.M.E.A. long-service awards presented to 44 municipal Hydro and public utilities commissioners.

Our photographer recorded the view on the back cover at the height of the registration period during the annual O.M.E.A.-A.M.E.U. Convention.

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# DR. RICHARD L. HEARN NAMED HYDRO CHAIRMAN

**A**N internationally eminent professional engineer, who has been associated with many of Ontario Hydro's major power projects in the past four decades, has been named as the Commission's seventh Chairman.

The appointment of Dr. Richard Lancaster Hearn as successor to the late Robert H. Saunders was announced on January 24 by Ontario's Prime Minister, the Hon. Leslie M. Frost. Following this announcement, the Commission named A. W. Manby as General Manager and Dr. Otto Holden as Chief Engineer.

## Management Reorganization

More recently the Commission announced reorganization of Ontario Hydro's senior management and engineering group, including the appointment of four Assistant General Managers. Designed to permit a more effective flow of executive functions, the redistribution of duties places the overall administration of the Commission's affairs in the hands of the General Manager, A. W. Manby. The Chief Engineer, Dr. Otto Holden, is directly responsible to the Commission for the completion of the vast Niagara and St. Lawrence power projects. The reorganization also includes the formation of a new Division, to be known as Organization Services.

In the new organization, shown on page 2, there are four Assistant General Managers reporting to the General Manager.

The Assistant General Manager—Engineering, George D. Floyd, is responsible for the Planning, Engineering, Construction and Research Divisions. The Assistant General Manager—Administration, J. Mervyn Hambley, is responsible

*(Continued on page 2)*



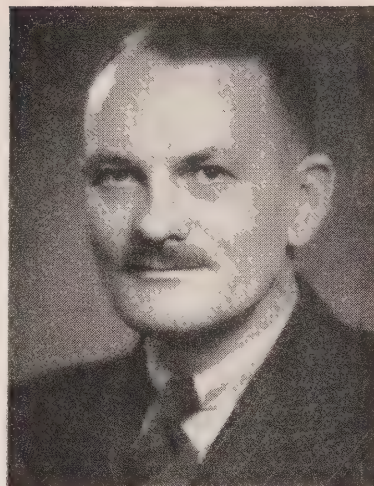
DR. RICHARD L. HEARN  
Chairman

for Operations, Consumer Service, Regions, Frequency Standardization, Security and the A. W. Manby Service Centre, Islington. The Assistant General Manager and Comptroller, E. Harold Banks, is responsible for Treasury, Accounting, Supply, Property, and a new division of Organization Services. The Assistant General Manager—Personnel, John Dibblee, is responsible for Collective Relations, Medical Services, Wage and Salary Administration, Employee Relations and Accident Prevention.

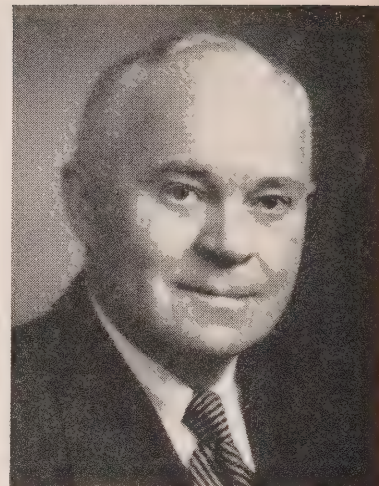
The Director of the St. Lawrence Power Project, Gordon Mitchell, and the Project Manager of Sir Adam Beck-Niagara Generating Station No. 2, W. L. Fraser, are directly responsible to the Chief Engineer.

### Dr. Richard L. Hearn

Dr. Hearn's elevation to the Chairmanship of one of Canada's largest public utilities culminates a professional en-

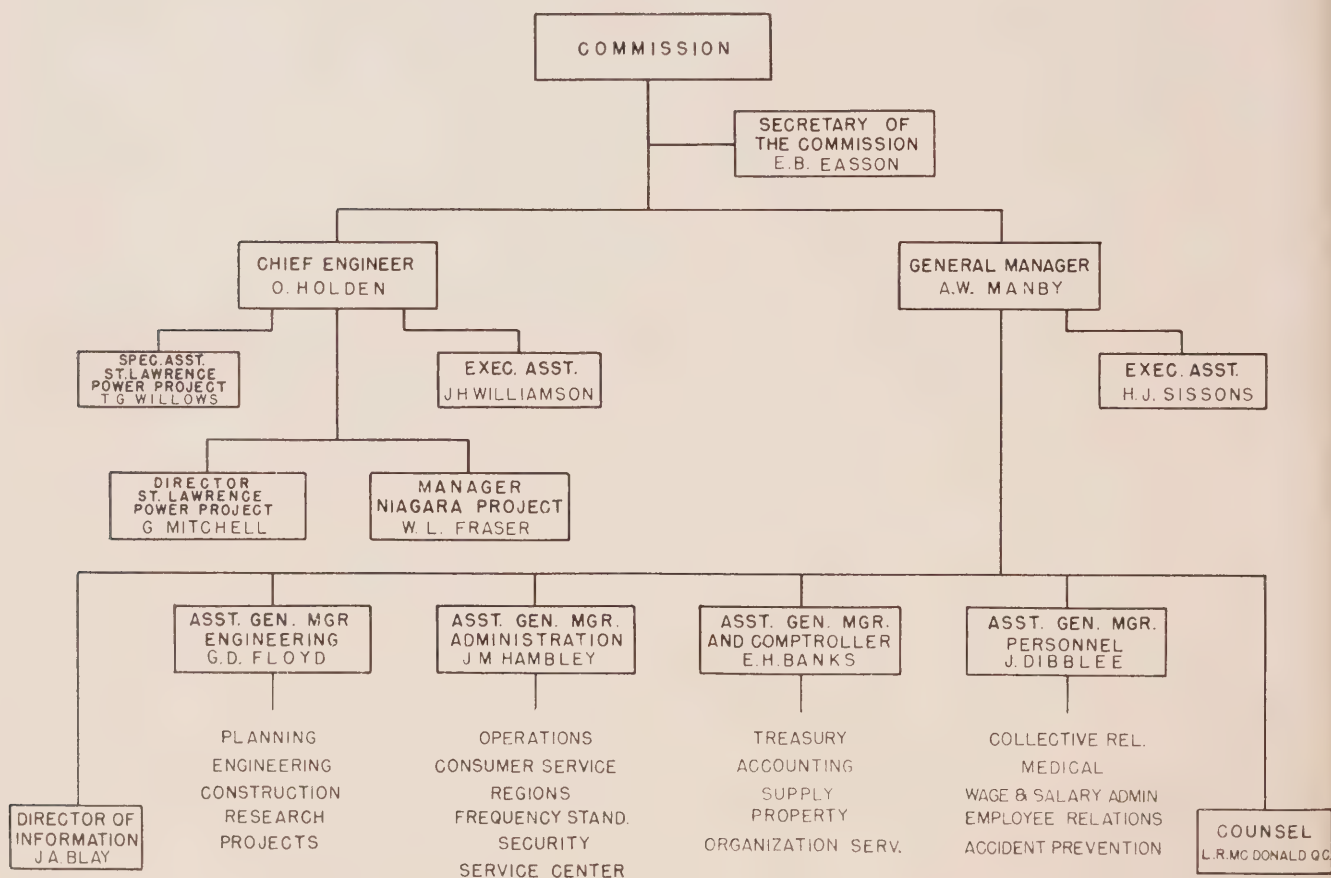


**A. W. MANBY**  
General Manager



**DR. OTTO HOLDEN**  
Chief Engineer

## THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO



MARCH 1, 1955



gineering career which dates back to 1913, when he graduated from the University of Toronto and joined the Commission's engineering staff. His first Commission project was as designer of the Wasdells Falls power project. He was closely associated with the design of the Queenston-Chippawa development (now known as the Sir Adam Beck-Niagara Generating Station No. 1) and later became Assistant to H. G. Acres who was in charge of the construction of this project.

Dr. Hearn gained valuable experience in the United States when, in 1921, he accepted the position of Assistant Chief Engineer with the Washington Water Power Company, Spokane, returning to Canada three years later to take the position of Chief Engineer and Secretary-Treasurer of H. G. Acres and Co. Ltd. From 1930 until 1942 he was with the Dominion Construction Co. and H. F. McLean Ltd., serving as Chief Engineer for a period of eight years, when he returned to Hydro in 1942 as Executive Assistant to the Chairman. Subsequently he was loaned as chief engineer in charge of construction of the Polymer Corporation synthetic rubber plant at Sarnia, and later acted as Canadian Technical Advisor to the Public Utilities Division of the Combined Production and Resources Board at Washington. In 1945, Dr. Hearn was named Hydro's Chief Engineer of Design and Construction, and, two years later became General Manager and Chief Engineer.

## A. W. Manby

Succeeding Dr. Hearn as General Manager, Mr. Manby has held various prominent engineering positions with the Commission. Named Hydro's Assistant General Manager—Administration in March, 1947, he served with distinction in that capacity until his latest appointment.

Born at Niagara Falls, Ontario, Mr. Manby received his early education there, and graduated from the University of Michigan in 1921.

Upon graduation, Mr. Manby entered the service of the Commission, holding several key positions until his appointment in 1938 as Assistant to the Chief Operating Engineer at Toronto. Three years later he became Assistant to the Chief Engineer, a post he held until his appointment as Assistant General Manager—Administration.

## Dr. Otto Holden

Dr. Otto Holden, the new Chief Engineer of Ontario Hydro has been associated with all phases of Hydro's expansion program, initiated in 1945. He brings to his new post a reputation as one of the world's leading hydraulic engineers, his counsel having been sought by countries as far distant as Australia. Born in Toronto, Dr. Holden graduated from the University of Toronto.

Joining the staff of the Commission in 1913, he filled various posts in the Hydraulic Department, and, in 1937, became Chief Hydraulic Engineer, a post he held until he was named Assistant General Manager—Engineering.

## G. D. Floyd

G. D. Floyd, Assistant General Manager—Engineering, was born in Westville, Nova Scotia, and received his Bachelor of Science degree (in Arts) from Dalhousie University. He later obtained his Bachelor of Science degree (in Electrical Engineering) from McGill University. Joining Ontario Hydro in 1919, Mr. Floyd has filled various positions in the Research and Engineering Divisions, and was appointed Director of Planning when this division was formed. He became Deputy Assistant General Manager—Engineering in 1953.

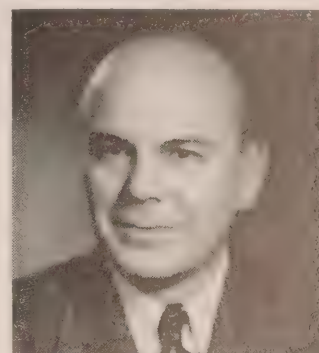
## J. M. Hambley

J. M. Hambley, Assistant General Manager—Administration, was born in Copper Cliff, Ontario, and graduated from Queen's University in 1929 with his Bachelor of Science degree. Following one year on the staff of the Canadian General Electric Company, he became associated with Ontario Hydro in 1930, serving in many important capacities in the Operations Division until

(Continued on page 39)



**G. D. FLOYD**  
Assistant General Manager—Engineering



**J. M. HAMBLEY**  
Assistant General Manager—Administration



**E. H. BANKS**  
Assistant General Manager and Comptroller

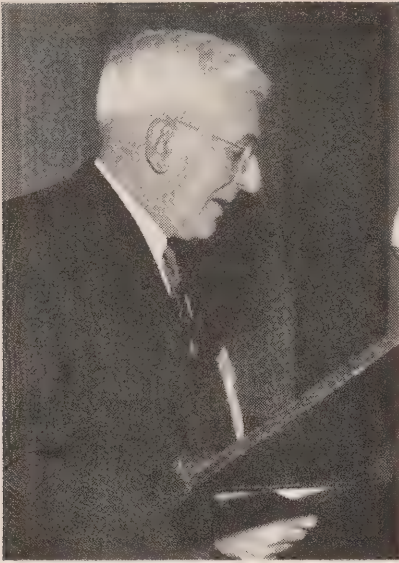


**L. R. McDONALD, Q.C.**  
Counsel



**JOHN DIBBLEE**  
Assistant General Manager—Personnel

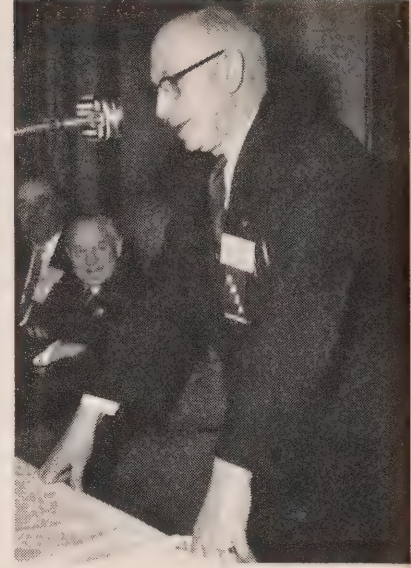




J. D. PHILLIPS  
Schreiber



SAMUEL MURCHIE  
Brantford Township



JOHN McMECHAN  
Toronto

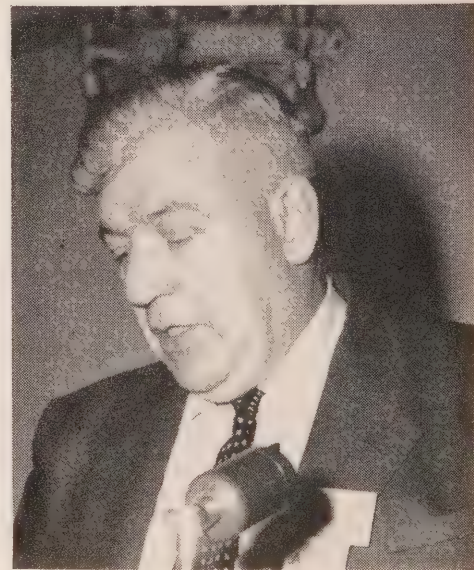
OMEA-AMEU CONVENTION - 1955

# Among the Speakers



THOMAS BARNES  
Niagara Falls

A. W. BROMLEY  
Kitchener





# SUCCESS FORMULA



LT. COL. A. A. KENNEDY  
O.M.E.A. President

**Must strive to ensure adequate power supplies  
at the lowest possible cost, O.M.E.A. President  
tells delegates during his report on activities**

**I**NDIVIDUALLY and collectively, the Ontario Municipal Electric Association must strive continually to ensure that Hydro customers receive an adequate amount of power at the lowest possible cost, O.M.E.A. President Lt. Col. A. A. Kennedy told delegates at the joint annual O.M.E.A.-A.M.E.U. convention.

In his review of the Association's activities during the past year, Col. Kennedy outlined a formula whereby this basic objective could be obtained.

"We must, first of all, satisfy ourselves that our part of the job, the retail distribution of power, is being done in the most efficient manner," he stated. "When all members can truthfully say that, to the best of their knowledge and ability, their own utility is operating efficiently, then I think we shall have a sound internal organization."

The other half of the problem, he said, is the responsibility of the O.M.E.A. "We must ensure that Ontario Hydro is delivering to our systems power at the lowest possible cost," Col. Kennedy declared. "This is a task which has been done in the past to a limited extent, and one which may never be done to perfection, but as long as we keep this thought in mind, I feel sure we will be working in the right direction. Though we may

never reach perfection, we must continually strive for it."

Noting that a great deal has been accomplished by the association in the past, Col. Kennedy asserted that an organization such as the O.M.E.A. cannot stand still if it is to flourish, and to meet the increasingly difficult problems which will arise in the future.

Col. Kennedy said that the association's relations with Ontario Hydro during 1954 "have been most cordial on all occasions and at all levels."

"In this connection," he continued, "I must refer to the advice and assistance given this body by Mr. Ross Strike, Ontario Hydro's Second Vice-Chairman. It would be impossible to calculate the many hours of hard work he has contributed to our organization. He has attended all district meetings but one, and never has he refused his time when requested, unless it was physically impossible for him to do so."

He spoke of the successful conclusion of negotiations pertaining to the St. Lawrence Power Project as a highlight of the year. Referring to the testimonial dinner held in July to honor Robert H. Saunders "for his outstanding contribution" toward the St. Lawrence Project, he termed it a success from every aspect.

"It is a pleasure to report that the dinner stood on its own feet financially," he said. "The small balance remaining after all bills were paid was contributed to the Ontario Hurricane Flood Relief Fund."

## Appointment Applauded

Applause greeted his remarks when Col. Kennedy spoke of the appointment of Dr. Richard L. Hearn as Chairman of Ontario Hydro to succeed the late Mr. Saunders.

"Dr. Hearn," he said, "is well-known to most of us and I am sure you will agree with me that no one could have been found who has acquired over 10 years as complete a knowledge of Hydro and its affairs. We are, indeed, fortunate to have a man with his experience and executive ability to fill this most important post."

In conclusion, Col. Kennedy paid tribute to the O.M.E.A. Secretary, D. P. (Bud) Cliff. "The executive has worked well," he said, "but it could only have accomplished what it has because of your secretarv. Bud Cliff is really the man who keeps this organization going, a man who is really dedicated to his job and who literally lives O.M.E.A." — A. A. Bolté.





APPROXIMATELY 880 DELEGATES REGISTERED FOR THIS YEAR'S JOINT CONVENTION.

# Convention Candidids

PLAID neckwear worn by H. G. McCandlish, Stayner is admired by fellow-Staynerites A. V. Gilbert, left, and Mayor J. A. Perry.



A. B. HAYMAN, North Bay, left, explains features of Hydro's Niagara model to Alex Nepitt and Mayor H. A. Prescott, Capreol.





GEORGE VanBridger, Bowmanville, second from left, was discussing the impact of the St. Lawrence Project with these delegates, left to right, C. V. Ellis, G. L. Loucks, and Milburn Hyslop who were representing Iroquois.



BIRDS of a feather in a sense, these New Toronto delegates, left to right, Arthur Prevost, W. J. Fisher, and T. J. Curtis, were found enjoying the sly humor of H. B. Mattson, Preston, right.



RESULTS of Hydro's press and publicity program, on display at the convention, receives the interested scrutiny of two youthful A.M.E.U. representatives, left to right, E. A. Washburn, Stratford, and C. S. Phelps, Sarnia.



# GOOD NEWS

## Hydro Chairman Announces \$3,520,932 Municipal Rebate

ADDRESSING a joint session of the O.M.E.A.-A.M.E.U. at this year's annual convention in his new capacity as Chairman of Ontario Hydro, Dr. Richard L. Hearn was able to give delegates the refreshing assurance that they could look forward to a period "when our power resources are fully adequate to our needs."

Dr. Hearn was able to give his audiences further good news when he announced that "preliminary figures on financial operations for the year indicate that revenues under prevailing interim rates were sufficiently in excess of costs to permit rebates to the large majority of cost-contract municipalities amounting to \$3,520,932." It will be necessary to render 13th bills to a few municipal utilities, he added.

Although he inserted the cautionary note that adjustments in some interim rates may be necessary in 1955, Dr. Hearn's announcement that "it is not expected that there will be any general increase in the wholesale cost of power to the municipal utilities," was greeted with obvious and enthusiastic approval by his large audience.

At the outset of his address, Dr. Hearn said he had assumed the duties of Chairman "at a time when I was looking forward to retirement, thus withdrawing from the heavy responsibilities that have been mine during the past several years."

### Splendid Leadership

In taking over his new duties, he was accepting a situation which "is not, and would not have been, of my choosing, but one which I accept in all humility, not so much as a tribute to me, but as recognition of the splendid leadership given by the management team with which it has been my privilege to be associated."

In a tribute to the memory of the late Robert H. Saunders, Dr. Hearn said that his predecessor had "associated himself so intimately with the Commission, gave himself so energetically and unsparingly

in its service, and so conscientiously regarded the trust reposed in him, that he became firmly identified in the public mind as 'Mr. Hydro'."

In the preparation and presentation of the reports of his stewardship, wherever they were given, the late chairman set a pattern all his own. Nothing was more distinctive of his tenure of office than the generosity with which he made information available to the press, over the radio, and through personal contact with organizations, large and small, throughout the province and even beyond the national boundaries.

While it would be "out of character" for anyone to emulate a style of reporting that was "peculiar to him," Dr. Hearn

assured his listeners that "we shall continue to use in the most appropriate way whatever facilities are available to keep the public informed of the activities of the Commission."

Turning to the question of power demands and resources, the speaker told his audience that the growth in primary power requirements during 1954 was approximately equivalent to the long-term annual rate of growth—about six percent. Through 10 years of unrelenting effort, the Commission has been able to provide for this continuing increase in demands, and at the end of the past year was fortunate enough to have a reasonable margin of reserve on its systems.

Additional capacity was made available







**DR. RICHARD L. HEARN**  
Ontario Hydro Chairman

DR. HEARN delivered his address during a joint session at this year's convention.



in two units at Pine Portage Generating Station and construction was underway on a new plant at Manitou Falls to take care of the growing needs of the Northern Ontario Properties, while work was started on the long-awaited St. Lawrence Power Project.

The most notable achievement during 1954 was the completion of seven of the 12 units at the Sir Adam Beck-Niagara Generating Station No. 2, which brought the Commission's total dependable peak capacity in all systems to an all-time high of 4,135,050 kilowatts in December last year. The speed with which this work has been accomplished was "a major factor in contributing to the fortunate position in which we found ourselves at the end of 1954."

With the remaining five units scheduled for service during 1955, the operation of the new station will be integrated with that of Sir Adam Beck-Niagara Generating Station No. 1 in order to derive the optimum amount of power and energy from water available under the Niagara Diversion Treaty.

#### Last Major Site

Dealing with the importance of the St. Lawrence Seaway and Power Project, Dr. Hearn said it is "the last major hydro-electric site for Ontario Hydro in southern Ontario."

While the economic importance of the seaway, like that of the great railways constructed in the last century, can be measured only in the light of the future industrial economy of both Canada and the U.S.A., "the importance of the power project will be more immediately realized as its facilities are placed in service to meet the power requirements of this province up to 1962."

In discussing future power requirements and resources, Dr. Hearn said it can be assumed, for the present, that power requirements will continue to grow at least as they have grown over the past quarter century and more, i.e., that demands will double in the next 12½ years. Resources, now under construction, will meet requirements up until 1962.

Thereafter the following possibilities are open: (1) the construction of hydro electric developments in less accessible places; (2) the use of coal, oil, or gas to produce steam-electric power near load centres; (3) the development of electric power from nuclear reactors located wherever economics, security, and national health may dictate.

Ontario Hydro is, at present, progressing with feasibility studies in collaboration with Atomic Energy of Canada Ltd. (see article "Approach to Nuclear Power," Page 22), and also, in association with the latter organization, is keeping in close touch with similar developments in the United States and the United Kingdom.

With almost half of the 25-cycle customers affected by the project changed over to 60-cycle power, the net cost of the Commission's frequency standardization program reached \$181,017,155 at the end of 1954.

#### Paramount Position

Every effort is being made in this, as in all other activities, to establish the Commission in a paramount position among utilities "for efficiency and economy of operation."

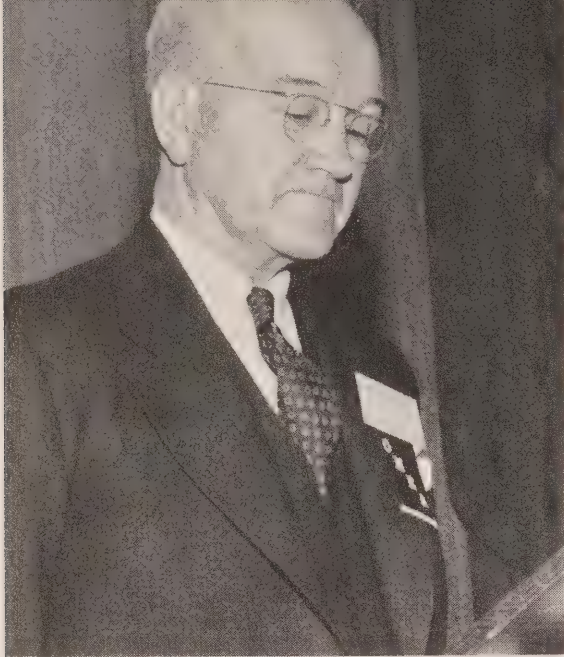
No stone is being left unturned in the search for economical procedures—the encouragement of manufacturing dual frequency equipment; the adoption of labor-saving methods; the reclamation of 25-cycle equipment, and the recovery of maximum value for scrap materials.

In addition to materials recovered from the frequency standardization program, the Commission has been able to dispose profitably of other surplus materials such as Bailey bridging, etc. A number of generating units, purchased some ten years ago, and no longer required for the emergency fuel-electric stations, were sold and made available to Pakistan under the Colombo plan.

In effecting economies in telecommunications, the Commission has extended its agreement with the Bell Telephone Company of Canada, thereby eliminating service duplications. Under the co-ordinated scheme, the number of telephone instruments has been reduced by nearly 400, leaving some 100 or more telephone circuits available for expansion.

"Economies and devices of this sort, valuable and important as they are, must reflect, in tangible form, the policy of this Commission that our affairs shall be conducted at the lowest cost consistent with efficient operation."

In concluding his address, Dr. Hearn introduced A. W. Manby, Hydro's General Manager, and Dr. Otto Hoffmann, newly-appointed Chief Engineer, who presented more detailed reports on the phases of Hydro operations for which they are primarily responsible. Reports of these addresses appear elsewhere in this issue.



W. ROSS STRIKE, Q.C.  
Hydro's Second Vice-Chairman

# "TOM, DICK AND HARRY"

## W. Ross Strike Discusses Utility Customer Relations

"**H**OW to treat customers" was the theme of an address by W. Ross Strike, Q.C., the Commission's Second Vice-Chairman, at the recent joint O.M.E.A.-A.M.E.U. convention.

Speaking as a convention delegate, with a background of some 21 years as a member of Bowmanville Public Utilities Commission to his credit, Mr. Strike emphasized that publicly-owned institutions cannot be managed in exactly the same way as private business. "The approach the function, and the result are all different, and the principles of management in one are not applicable in the other."

### Operate Like Goldfish

Perhaps the first difference is the fact that public officials operate like goldfish in a bowl, or in offices with glass walls, he said. These officials are under constant surveillance by all three of those famous public characters—Tom, Dick and Harry—and it requires long and painful experience before a middle course can be steered that will, more or less, satisfy all three, and permit the official to do a worthwhile job.

Indicating that friends Tom, Dick and Harry appear in many different guises, Mr. Strike suggested a look at only three of these categories.

"Tom," he said, "may come to us as a new customer who may or may not be familiar with our contract and how we operate under it, or our system of billing and discount."

Some offices miss a chance of getting

a new customer on their side at once by treating him in a very perfunctory manner.

"Every new customer should be given special treatment. Some special person on the staff, from the manager down, should be designated and then trained to do it," the speaker suggested.

Then Mr. Strike turned to Dick—the customer who feels he has been treated very badly and who comes into the office to complain about it. Here, it was stressed, is precisely where public and private business part company. He knows he must get satisfaction here because he cannot obtain Hydro service elsewhere.

His complaint may have some justification or no merit whatever, but he has "a right to be heard because he is a part owner of the business and because he is involved with a monopoly," Mr. Strike declared.

When he finds he can get no satisfactory solution from the utility, Dick takes his complaint to a local commissioner, who, in turn, must investigate through the manager. The manager may have to investigate further.

By this time it will be a difficult job to satisfy Dick because "aided and abetted by his friends, he has become at least in his own mind, quite a public figure with a real grievance."

"If Dick did have a real complaint that should have been adjusted, what a mountain has been built around an initially small molehill. What time has been wasted and whose faces are red?"

Again, Mr. Strike continued, there should be some person or persons among the senior staff members trained to handle complaints.

"The first requisite is never to lose your temper. The second is to remain courteous even under great provocation. The third is to be patient in explaining all the factors involved in the complaint and making an honest effort to satisfy the customer that he has been treated fairly."

The speaker recommended that local commissions record and review all complaints. Such a review might indicate where changes in methods could be made for the betterment of administration and public relations, he pointed out.

Having dealt with Tom and Dick, Mr. Strike discussed "good old Harry." Conceivably, he might be a customer who, in the best Hydro tradition, is cut off for not paying his account.

"Right here," he said, "I am going to confess that along the way in my Hydro associations I have known at least one or two local managers whom I vaguely suspected rather enjoyed that thrill of cutting off a delinquent customer who had paid no attention to demands for payment."

He suggested that all commissions review the whole procedure followed by their particular utility in disconnecting services. "I am aware," Mr. Strike stated, "that practically every local utility has a

*(Continued on page 37)*



# SUCCESSFUL YEAR

Increased power output and demands  
reported by Hydro's General Manager



A. W. MANBY  
Hydro's General Manager

**E**NERGY generated and purchased by Ontario Hydro in all its systems during 1954 was up seven percent over the total for the preceding year, Hydro's General Manager, A. W. Manby, told delegates at the 46th annual joint convention of the O.M.E.A. and A.M.E.U.

Reporting upon what he termed "so successful a year in the Commission's operations," Mr. Manby said Hydro's stations produced nearly two million kilowatthours more energy last year than in 1953.

"Water conditions," he stated, "worked in our favor during the year, particularly during the period following the unfortunate loss of output at the Richard L. Hearn Generating Station. Had the loss of this output occurred at a time of unusually low water storage such as occurred during the summer and autumn of 1953, the effect would have been much more serious."

Mr. Manby noted that the capacity of the Commission's systems at the end of 1954 was 4,135,050 kilowatts, or 16 percent greater than in the previous year.

Primary energy requirements for all systems showed an overall increase of 4.2 percent over 1953 to 20,789,908,896 kilowatthours, he reported. In the Southern Ontario System, where about 85 percent of the total power demands are experienced, the increase was six percent, with peak demands reaching 3,115,-

842 kilowatts. Primary power requirements were up in amounts varying from 3.4 percent in the Northeastern Division to 13.1 percent in the Northwestern Division.

This growth, Mr. Manby said, was, in part, attributable to increases in the number of customers supplied and to greater demands by most customers. Total figures indicate that, of the 18,650,767,685 primary kilowatthours supplied in wholesale quantities to all system customers, 57.3 percent went to the municipalities, 34.1 percent to large industrial customers, and 8.6 percent to the rural customers.

"The total primary energy thus supplied was greater by 4.4 percent than in 1953," he stated. "The utilities' proportionate share of this total was substantially greater than in 1953, having increased by the same amount as the direct industrial customers' share declined."

Referring to the growth of Hydro's rural services, the speaker said that the Commission was operating 42,540 miles of rural primary distribution line at the end of 1954, and serving 390,617 customers in 926 villages and other small communities and on farms.

## Rural Demand Increased

"The growth of the demand for power by rural customers was particularly marked in 1954, when the maximum

monthly sum of the coincident peak loads of the rural operating areas was 10.2 percent greater than in 1953," he declared. "The corresponding increase for the municipal utilities was 7.9 percent more than 1953 while the large industrial customers showed practically no increase."

Turning to frequency standardization, Mr. Manby said that the Commission estimates that it has passed the half-way mark in converting its Southern Ontario customers from 25 to 60 cycle power supply. He noted that, year by year, Hydro completes standardization work equivalent in value to about \$40 million.

"The schedule and cost of the entire frequency standardization program must be extended in accordance with the amount of 25-cycle load growth," he said. "We have tried to restrict this growth element by careful scheduling of our operations."

Mr. Manby reported that of the total cost of frequency standardization to date, an additional \$24,207,053 is now held in equipment and supplies for future standardization operations. A total of \$828,545 spent on standardization of rural facilities has been recovered from rural revenue.

Last year, 4,850 more customers had their equipment converted than in 1953. The total number of items standardized

*Continued on page 36.*

# KEY ROLE

Chief Engineer reviews Ontario Hydro's engineering and construction activities



**DR. OTTO HOLDEN**  
Chief Engineer

**O**NTARIO HYDRO has a key role in the development of the province's new mining areas.

This fact was revealed recently by Dr. Otto Holden, Hydro's new Chief Engineer, in an address to O.M.E.A.-A.M.E.U. delegates during their recent annual convention in Toronto.

Reviewing the Commission's engineering and construction activities in 1954, Dr. Holden announced that surveys started last fall for Hydro lines to new mining areas in northern Ontario: the base metal field near Lake Manitouwadge, and the uranium discoveries north of Blind River.

"Construction work started last month and power will be supplied over the lines before the end of this year," he stated.

Dealing with the Commission's power generation projects, Dr. Holden also announced that the main, 12-unit powerhouse at the Sir Adam Beck-Niagara Generating Station No. 2 (officially placed in service last August), will be essentially completed by the middle of 1955, and will have an installed capacity of 900,000

kilowatts—"as large as the Commission's half of the St. Lawrence powerhouse."

## Gratifying Events

The commencement of actual work on the St. Lawrence Power Project, and the official opening of the new Niagara plant were "two particularly gratifying events" of 1954, Dr. Holden stated.

In addition to these two immense projects, two smaller generation projects were underway last year. Both are to serve northwestern Ontario; together they will increase the resources of the lakehead area by 100,000 kilowatts. Two units were added to the station built at Pine Portage on the Nipigon River five years ago and a new station, Manitou Falls, is being built in the Red Lake area.

The Manitou Falls plant will develop one of the several potential sites on the English River between Ear Falls and the Manitoba boundary. The permanent road to the station and a 115-kv transmission line were both completed last year.

## Three Initial Units

The new station will be a low-head development with large storage. Three units are planned for this station and consideration is being given to the installation of a fourth unit, and partial construction for the addition, at a later date, of a fifth unit. The station is scheduled for service next year.

Directing the attention of his audience to the subject of extensions to the transmission network and to transformer and switching stations throughout the province, Dr. Holden said "this far less spectacular but just as necessary work represented an expenditure during 1954 of some \$31 million, while another \$22 million was spent on rural facilities."

The lines required to deliver power from the Sir Adam Beck-Niagara Generating Station No. 2 were substantially completed by the end of last year. This year Hydro will turn its attention to the final preparations for the lines from the St. Lawrence Power Project. These lines will be started next year.

Among the more important 115-kv lines under construction last year were a line from Cornwall to Brockville and the second line from Port Arthur to the Steep Rock area. Last fall surveys started for lines to two new mining areas in northern Ontario; the base metal field near Lake Manitouwadge and the uranium discoveries north of Blind River. Construction work started last month and power will be supplied over the lines before the end of this year.

Although it was originally intended to install initially only six units at the new Sir Adam Beck Station, Hydro advanced its plans considerably as attempts to push ahead with the St. Lawrence were frustrated. In the face of increasing demands for power it was decided successively to install seven, and then twelve units, and finally to embark on the pumped-storage scheme and to make provision for four more units at the main powerhouse.

"Throughout all these changes in plan forced upon us by changing circumstances, the actual work at the project went ahead smoothly," the speaker said.

As the main powerhouse of the Sir Adam Beck No. 2 project nears completion, the interest at Niagara shifts to the remedial works and to the pumped-storage scheme. The latter scheme, scheduled for initial operation next year and completion by 1957, involves the creation of a reservoir immediately north of the new canal and the construction of a powerhouse. Six reversible units are to be installed which can be operated either as pumps or as generating units. During off-peak periods these units will pump water from the main canal into the storage reservoir and when water is released from the reservoir, the same machines, operating in reverse, will generate power. The water will, of course, be used a second time after its release by units in the main generating stations at the foot of the Niagara gorge.

Also scheduled for completion in 1957

*(Continued on page 40)*



# TOUCHING TRIBUTE

## Convention delegates honor memory of the late Robert H. Saunders

**M**EMBERS of the O.M.E.A. and A.M.E.U. paid a brief but moving tribute to the memory of the late Robert H. Saunders at their annual convention this year.

To Lt. Col. A. A. Kennedy, O.M.E.A. President, fell the privilege of delivering the eulogy to this "man of boundless energy."

Recalling Mr. Saunders' assumption of the office of Ontario Hydro Chairman, Lt. Col. Kennedy said that his "dynamic leadership quickly organized all available forces" to alleviate the black situation caused by a shortage of power.

"The more we associated with him the more we admired him," the O.M.E.A. President continued.

"We learned to admire his frank and friendly approach to people of all walks of life; his interest in their problems, and his desire to help them with their troubles—a desire which was expressed in many practical ways."

His associates appreciated his integrity. If a promise was made, he would move "heaven and earth" to live up to that promise. His love of life, ready wit, and charming manner made him an excellent companion.

"He was, in short, a man of fine character who will be missed not only by the city he loved, by the province he served so well, but, indeed, by all of Canada."

The late Hydro Chairman will be remembered for years to come for what Lt. Col. Kennedy described as "his greatest accomplishment"—the overcoming of all obstacles which stood in the way of realizing the O.M.E.A.'s most cherished dream—the production of power from the St. Lawrence River. It is a fitting tribute to him that this new source of power has been named the Robert H. Saunders-St. Lawrence Generating Station.

"Let us not, at this time, forget his sorrowing family who have accepted so



**LT. COL. KENNEDY, O.M.E.A. President, left, who gave the tribute to Mr. Saunders' memory, pauses while A.M.E.U. President Taber lays a rose on an open Bible during memorial ceremony.**

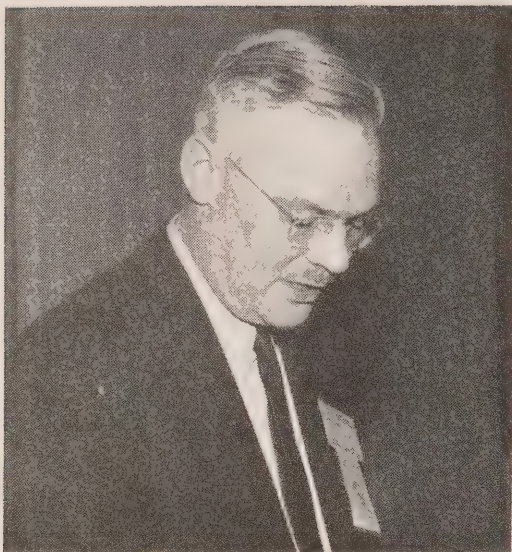
bravely this great loss. I am sure that we all extend to them our deepest sympathy."

At the conclusion of the eulogy, the audience rose to pay a silent tribute. With the hushed strains of the hymn, "Lead, Kindly Light," filling the hall, the lights were dimmed slowly. Stepping to a lectern in front of an illuminated photograph of the late Chairman, A.M.E.U. President Arthur Taber placed a rose on an open Bible. Concluding this impressive salute to Mr. Saunders' memory and achievements, Horace Brown, of Ontario Hydro's Information Division staff, read his poem which follows:

**Robert H. Saunders  
1903 - 1955**

*"This was a man who lived a dream,  
Gave it the substance of reality,*

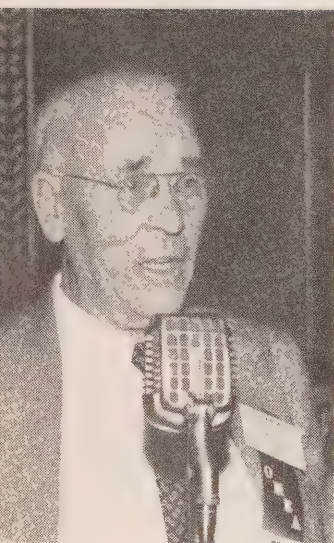
*And, dying with the task yet unful  
filled,  
Passed on to us the need to make it  
whole.  
This was a man of simple dedication,  
Who strove in sublime will with  
one thought;  
To keep what was the people's for the  
people,  
Increasing the talents handed to his  
care.  
Too few of us are touched with that  
spare wand  
That lifts us up and carries us to the  
stars.  
Not many love a land with single  
hearted zeal,  
Or have a goal of greatest good for all  
When such there be, and such was he,  
We take him to our hearts for all time  
to come."*



T. J. MOFFAT  
Listowel

# POSITIVE APPROACH

***Lively Debates Feature Annual  
O.M.E.A. Resolutions Session***



H. O. HAWKE   
Galt

W. E. WRIGHT  
 Toronto Township



A POSITIVE approach to the many current problems facing the Ontario Municipal Electric Association and its member municipalities was manifested by delegates at the 46th joint annual convention of the O.M.E.A.-A.M.E.U. this year during consideration of 14 resolutions.

Dealing with the more formal and controversial motions, members participated in vigorous discussions before the question was put to a vote. In some cases, a show of hands was insufficient to settle the resolution, the delegates being asked to stand while a full count was taken.

One such standing vote was necessary on the very first resolution which requested the Ontario Government to enlarge The Hydro-Electric Power Commission of Ontario and give the O.M.E.A. representation on it. The motion underwent a substantial change when an amendment, introduced by Bertram Merson, Chairman of the Toronto Electric Commissioners, won majority support.

The amendment stated that "in the case of a vacancy on The Hydro-Electric Power Commission of Ontario, or in the event of the enlargement of the present Commission, we request the Ontario Government to give the Officers of the O.M.E.A. every opportunity to present their views as to the appointment of a person, or persons, who, in their opinion can best represent the interests of the O.M.E.A., and Hydro in general, and

that such opportunity be afforded our officers well in advance of any appointment."

Mr. Merson based his opposition to the original resolution on the premise that the O.M.E.A. has a "perfect right to advance names," but that the responsibility to appoint a man to the Commission rests entirely with the Ontario Government.

"I hope the day will never come," Mr. Merson argued, "when any organization will have the right to tell any government, whether it be federal or provincial, whom they should appoint to any post. We elect our governments to do that job."

The business session also passed a resolution which, in effect, would permit a municipality to contribute towards "The Robert H. Saunders Memorial Fund." Noting that under the laws of Ontario, municipal utilities are not permitted to make donations, the convention resolved to ask Ontario Hydro to contribute on behalf of any municipality desiring to do so. Such gift, however, could not exceed two cents per kilowatt of peak demand and the expense would be added to the cost of power to the municipality.

A much-discussed question during O.M.E.A. district meetings throughout the past year, that of standardizing customer deposits, was introduced on the floor. It resulted in a resolution that committees be established by the





DELEGATES FOLLOWED CONVENTION DISCUSSIONS WITH KEEN INTEREST.

O.M.E.A. and the A.M.E.U. to study the matter and make recommendations for a standard practice which municipalities would be able to adopt.

#### Favor Small Power Sites

Delegates also approved a resolution asking Ontario Hydro to give favorable consideration to the development of smaller power sites within the areas operated by any municipal Hydro commissions or public utility commissions. Such power developments would have to be carried out in accordance with Hydro standards, the resolution stated.

W. E. Wright, Chairman, Toronto Township Hydro-Electric Commission, told the session that possible power sites may be created on the Credit and Humber Rivers in the Toronto area as a result of proposed dam construction for flood control and conservation work believed necessary to avert future damage such as occurred following Hurricane Hazel last fall.

The convention unanimously decided to ask Ontario Hydro to consider the distribution of material advising the general public of the liability involved in television antennae causing damage to electrical distribution systems.

Details of the motions and their disposition were as follows:

#### Amend Resolution

Three resolutions dealing with the appointment of an O.M.E.A. representative

on the Commission were deleted and consolidated into one motion from the Resolutions Committee:

WHEREAS the O.M.E.A. recognizes the splendid contribution which the present members of The Hydro-Electric Power Commission of Ontario have made and are continuing to make in the development and operation of Hydro, and the Association is conscious of their untiring energy and unswerving devotion, and WHEREAS the O.M.E.A. has repeatedly, constantly, and continuously pressed for the right to specifically name one or more representatives to The Hydro-Electric Power Commission, and WHEREAS it is universally accepted that the real owners of property have direct control over the property except in cases of bankruptcy, and WHEREAS the electrical utilities represented by the O.M.E.A. have major ownership in properties administered by such Commission and, therefore, are entitled to some measure of direct representation on The Hydro-Electric Power Commission of Ontario, THEREFORE BE IT RESOLVED that the O.M.E.A. again request the Government of the Province of Ontario to give it representation on The Hydro-Electric Power Commission and to this end that they request the enlargement of The Hydro-Electric Power Commission of Ontario and that the President name a Committee to take all reasonable and effective action to have this right made effective.

This motion was superseded by the following amendment:

RESOLVED that in the case of a vacancy on The Hydro-Electric Power Commission of Ontario or in the event of the enlargement of the present Commission we request the Ontario Government to give the Officers of the O.M.E.A. the opportunity to present their views as to the appointment of a person or persons who in their opinion, can best represent the interests of the O.M.E.A. and Hydro in general, AND THAT such opportunity be afforded our officers well in advance of any appointment. (Carried.)

From the Resolutions Committee WHEREAS the principle of taking consumer deposits from tenants of property to secure the utility account for power was established many years ago and monthly billing was the custom, and WHEREAS the amount of the deposit, in many cases, has not changed in keeping with bi-monthly billing and increased use of power by consumers, and WHEREAS it is evident that there is no semblance of uniformity among the municipalities either as to amount charged or the method of administering the trust, and WHEREAS it would appear, from the interest shown by the commissioners and managers alike, at district meetings where this question was the subject of panel discussion, that the municipalities would welcome leadership in the problem from the O.M.E.A.

*Continued on page 10*

THEREFORE, be it resolved that the O.M.E.A. request the A.M.E.U. to form a committee which would work jointly with a committee of the O.M.E.A., and after careful study of the subject, make recommendations for a standard practice which the municipalities could adopt if they desire, and be it further resolved that the findings of the committee and their recommendations be circularized to the member municipalities. (Carried.)

From the Board of Directors: WHEREAS there has been formed a Committee known as "The Robert H. Saunders Memorial Fund" Committee, and WHEREAS the O.M.E.A. has been approached by this committee for contributions, and WHEREAS, under the laws of the Province of Ontario, municipal utilities are not permitted to make donations, THEREFORE BE IT RESOLVED that the O.M.E.A. request The Hydro-Electric Power Commission of Ontario to make a donation on behalf of any municipality desiring to contribute not to exceed two cents per kilowatt and that the sum be added to the cost of power to the municipalities AND FURTHER that this contribution will not be more than one-third of the total amount collected by the committee. (Carried.)

From the Paisley Hydro Commission: WHEREAS at the annual meeting of the O.M.E.A., held in 1953, a resolution was passed requesting the Association to ask The Hydro-Electric Power Commission of Ontario to treat the power used by the municipally-owned arenas, community centres, and ball parks as municipal power and the O.M.E.A. were advised by The Hydro-Electric Power Commission of Ontario that this would be written into the interpretation of rates, which has not been done, and we understand cannot be as legislation will not permit, THEREFORE now be it resolved that the O.M.E.A. petition the Ontario Government requesting them to pass legislation which will permit The Hydro-Electric Power Commission of Ontario to rebate the profit on electric energy used by arenas, community centres, and ball parks owned by municipalities, the same as on street lighting and power used by pumping stations.

This motion was deleted and substituted by:

RESOLVED that Paragraph 46 of the Standard Interpretation of Rates be amended and that the word "Unrestricted" in the first sentence be deleted. (Carried.) (Paragraph 46 reads in part as follows: Contracts may be made for unrestricted short-term power for not less than four months of the calendar with

## O.M.E.A. BOUQUETS

ONTARIO HYDRO's Information Division, and also the Editor and staff of Ontario Hydro News were the recipients of two much-appreciated bouquets from delegates at this year's annual O.M.E.A. convention when they unanimously endorsed the following motions:

"BE IT RESOLVED that this Association go on record as expressing our appreciation to the Public Relations and Public Information Departments of Hydro for their co-operation and assistance with this Convention."

"RESOLVED that we extend our appreciation to the Editor and staff of Ontario Hydro News whose praiseworthy services have been a great benefit to our Association."

any portion of the month of the calendar billed as a full month.)

From District 5: THAT whereas Section 112-1C of the Power Commission Act of Ontario states as follows:

"That any surplus to the extent to which such surplus is derived from the supply of electrical power or energy for the lighting of the streets of the municipality or for the operation of any street railway or electric railway or any public utility of the corporation other than an electric utility, by payment of such surplus or of such portion thereof as the Commission may deem proper, to the treasurer of the municipality to be applied to the general purposes of the municipality, AND whereas all municipal commissions are now paying full municipal taxes on land and buildings to the corporation, THEREFORE BE IT RESOLVED that District No. 5, through the O.M.E.A., request that the Power Commission Act of Ontario be revised to eliminate the costing of all municipal services. (Referred to an Executive Committee studying the matter.)

RESOLVED that Ontario Hydro be requested to give favorable consideration to the development of presently unused water power within the area operated by any municipal Hydro commission or public utility commission, provided that such power developments are carried out in accordance with Ontario Hydro standards and the future needs of the Ontario Hydro are protected in a reasonable manner. (Carried.)

### Defeat Licensing Motion

WHEREAS a draft bill for the "Provincial Licensing of Electricians" sponsored by the Electrical Contractors' Association of Ontario, and the Ontario Provincial

Council International Brotherhood of Electrical Workers has been under consideration by various interested bodies, and WHEREAS such licensing as is presently in effect is on a local basis without any uniformity as to the qualifications required, and WHEREAS the establishment of a provincial licensing authority would be a protection to life and property by ensuring that those who engage in the trade of making electrical installations are properly qualified to do so, NOW THEREFORE BE IT RESOLVED that the O.M.E.A. petition the provincial government to enact suitable legislation at the earliest possible date. (Defeated.)

From District 6: That District No. 6 O.M.E.A. suggest to Ontario Hydro that some consideration be given either through advertising or other promotional material to advising the public of their liability with respect to the installation of TV antennae causing damage to electrical systems. (Carried.)

THAT the O.M.E.A. is concerned with the tendency to develop one great metropolitan area rather than several moderate-sized cities in Ontario, bringing problems of power distribution and public safety, and THEREFORE the O.M.E.A. give leadership in planning to encourage decentralization, and that the President assign responsibility for leadership in that respect and that this resolution be submitted to the O.M.E.A. (Defeated.)

RESOLVED that this Association go on record as expressing our appreciation of the help and co-operation of the Royal York Hotel and the other Toronto hotels which assisted in accommodating our delegates; the Press and Entertainment Committee, which have added so greatly to the success of our Convention. (Carried.)—by A. A. Bolté.





**D. P. CLIFF**  
O.M.E.A. Secretary-Treasurer

# STEADY GROWTH

**Total of 281 municipalities  
now members of the O.M.E.A.**

**T**OTAL membership in the Ontario Municipal Electric Association reached 281 in 1954, with two new municipalities being added to the membership roster.

The foregoing announcement was made by D. P. Cliff, O.M.E.A. Secretary-Treasurer, in presenting his report to members during the recent annual convention in Toronto.

Pointing to the fact that the association's 281 member municipalities purchase 98.91 percent of the power supplied to the 325 Hydro cost-contract municipalities in Ontario, Mr. Cliff said that the O.M.E.A. was maintaining the record of steady growth "which it has enjoyed from the very beginning."

In a tribute to the late Chairman Robert H. Saunders, Mr. Cliff said that his "sudden and tragic passing meant a distinct loss to the Association. We mourn the loss of one who had attained the highest rank in our Hydro family.

"We can take pride in the fact, however," the speaker said, "that Mr. Saunders was made aware of our appreciation for his outstanding service while he lived. The testimonial dinner given him by members of the O.M.E.A. and the naming of the St. Lawrence power project in his honor, proved to be a most timely affair."

Reporting an active year in O.M.E.A. affairs, the Secretary-Treasurer said that in 1954 there were five meetings of the Board of Directors, as well as two other important conferences.

The first of the latter meetings took place on March 29, when members of the board met with the executive of the A.M.E.U., and the Commission and officers of Ontario Hydro. At this conference, Mr. Cliff said, policy and other matters of mutual concern were discussed.

Then, on June 3, members of the executive committee of the board met with the presidents and secretaries of the districts, and plans were formulated for the district annual meetings.

## Financial

The financial report for 1954 showed assets of \$12,533.49 at the end of the year, made up of cash and bonds. Income for the year was in excess of expenditures by \$358.84.

"The friendliness and efficiency of your president and the Board of Directors has made my duties as secretary of your association during the past year a pleasurable experience," Mr. Cliff told the convention. "The cordial relations and the desire to co-operate that exist between the A.M.E.U., Ontario Hydro, and your association have always been in evidence, and continuing in that spirit the future should hold no fears for the association's success."

## Resolutions

The secretary-treasurer reported action taken on resolutions passed at the 1954 annual meeting, as follows:

1. Resolutions proposing the annual

election of a First Vice-President. The policy has been adopted of appointing an Executive Vice-President who will act as President in the event of the absence or death of the President.

2. Resolution proposing a co-operative fire insurance plan for member municipalities. A special committee has been appointed which will study and report on the plan.

3. Resolution requesting the provincial government to enact legislation outlawing strikes by utility employees. The government has acknowledged the resolution, but there is no evidence, as yet, that favorable consideration is contemplated.

4. Resolution requesting a definite policy with respect to the basis upon which urban Hydro commissions shall be required to take over such plant and installations transferred from Ontario Hydro as a result of annexation. A committee was appointed to study the matter and report.

5. Resolution requesting Ontario Hydro to adopt Red Seal Adequate Wiring specifications for rural domestic installations, particularly with reference to entrance panels. The Commission replied that it was not considered equitable or fair to compel customers to install a service of greater capacity than needed. A survey showed that a 35-ampere service is all that is required for adequate installation for a rural or urban residential service.

*(Continued on page 40)*

# HOWARD HEADS A.M.E.U.

Lt. Col. A. A. Kennedy Re-elected President of O.M.E.A. for 1955

**D**ELEGATES at this year's convention enthusiastically endorsed Lt. Col. A. A. Kennedy as President of the Ontario Municipal Electric Association for a second term.

Chairman of the Owen Sound Public Utilities Commission to which he was elected in 1945, Lt. Col. Kennedy was appointed to the Presidency to complete the term of the late Loftus H. Reid, who died on April 21, 1953. Last year delegates confirmed their approval of this choice by electing him as President for 1954.

## A.M.E.U. President

Manager of Thorold Public Utilities Commission since 1948, H. Allan Howard was elected as President of the Association of Municipal Electric Utilities for the ensuing year. He succeeds A. W. H. Taber, Fort William.

Mr. Howard, born at Hagersville on August 13, 1909, has been associated with Hydro in various capacities for the past quarter-century. A son of the late Harry Howard, a former Hagersville Hydro Commissioner, the new A.M.E.U. President was educated at Hagersville public and secondary schools, also at Edison Institute, and New York University, New York City.

He started his electrical career with Ontario Hydro in 1930 as a member of the staff of Haldimand R.O.A. In 1933 he became Superintendent of the Caledonia Hydro system, being appointed Manager by the Brantford Township Hydro-Electric Commission in 1942. On December 1, 1948, he went to Thorold as Manager of the local utility.

Actively identified with the Thorold Kiwanis Club, the Niagara Falls Club and the Masonic Order (Mountain Lodge, A.F. & A.M.), Mr. Howard lists fishing



O.M.E.A. President Lt. Col. Kennedy, left, congratulates A.M.E.U. President H. A. Howard.

and golf among his leisure interests. Keenly interested in A.M.E.U. activities for several years, he served four terms as a district director and one year as a director-at-large. He is also a member of the American Institute of Electrical Engineers and an associate member of the Illuminating Engineering Society.

## O.M.E.A. Officers

Elected as Honorary President of the O.M.E.A. was Ontario Hydro's new Chairman, Dr. Richard L. Hearn, while Frederick Biette, Chatham; K. A. Christie, Toronto; C. J. Halliday, Chesley; H. O. Hawke, Galt; M. J. Elliott, Bowmanville, and G. F. Hutcheson, Huntsville, were named Honorary Vice-Presidents.

District Vice-Presidents for 1955 will be: E. V. Dyke, Smiths Falls; C. J. Halliday, Chesley; E. R. Freeman, Port Arthur; W. E. Wright, Port Credit; Thos. Barnes, Niagara Falls; T. J. Moffat, Listowel; J. S. Killingsworth, London, and S. G. Thomson, Chatham.

District Directors elected for the ensuing year were: J. G. Baldwin, Lindsay, and Dr. R. A. Patterson, Kemptonville, representing District 1; A. A. Kennedy, Owen Sound, and W. J. Cross, Hanover, District 2; C. H. Moors and J. R. Pattison, Fort William, District 3; Bertram Merson, Toronto, and Dr. V. S. Wilson, Islington, District 4; W. B. Elliott, St. Catharines, and C. R. Buss, Thorold, Dis-





FIRST meeting of the 1955 A.M.E.U. executive drew a good attendance. Seated, left to right: Robert Butter, Owen Sound; E. A. Washburn, Stratford; President Howard; A. W. H. Taber, Fort William; J. A. Williamson, Niagara Falls. Standing, left to right: C. S. Phelps, Sarnia; F. G. Greenslade, Kenora; A. A. Kidd, Cochrane; J. W. Hammond, Hamilton; F. G. York, Ottawa; Ray Pfaff, St. Catharines; W. H. Powell, Peterborough. Back row, left to right: W. R. Mathieson, and John Torrance, Etobicoke.

ATTENDING the first meeting of the new O.M.E.A. executive were, front row, left to right: W. J. Cross, Hanover; A. J. Girdwood, Guelph; Secretary D. P. Cliff, Dundas; President A. A. Kennedy, H. O. Hawke, Galt; Thomas Barnes, Niagara Falls, and J. G. Baldwin, Lindsay. Standing, from left to right: C. H. Moors, Fort William; Dr. V. S. Wilson, Etobicoke Township; Bert Merson, Toronto; Gordon Fraser, Parkhill; G. H. Glover, St. Marys; W. E. Wright, Toronto Township; W. B. Elliott, St. Catharines; C. R. Buss, Thorold, and J. R. Pattison, Fort William.



trict 5; G. H. Glover, St. Marys, and H. O. Hawke, Galt, District 6; W. F. Craig, Woodstock, and Gordon Fraser, Parkhill, District 7; W. P. Bolton and G. H. Fuller, Windsor, District 8.

#### A.M.E.U. Officers

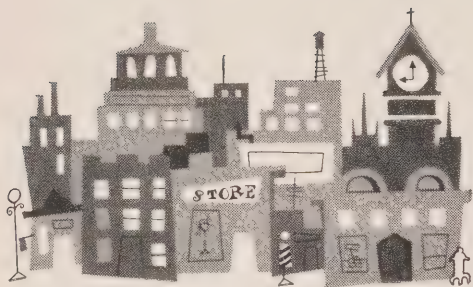
E. A. Washburn, Stratford, was named Vice-President of the A.M.E.U. Directors-at-large are: Robert Butter, Owen Sound, G. R. Davis, Kingston, and J. A. Williamson, Niagara Falls. District Directors: Eastern, F. G. York, Ottawa; East Central, W. H. Powell, Peterborough; Georgian Bay, Wm. G. Lane, Collingwood; Niagara, Ray Pfaff, St. Catharines; North-

eastern, A. A. Kidd, Cochrane; Northwestern, Frederick Greenslade, Kenora; Toronto, John Torrance, Etobicoke; Western, C. S. Phelps, Sarnia, and West Central, J. W. Hammond, Hamilton.

The following Committee Chairmen were selected for 1955:

Accident Prevention and Health Promotion Committee—Ronald Harrison, Chairman; A. W. H. Taber, Vice-Chairman; Accounting and Office Administration Committee—James Hammond, Chairman, Jack Cook, Vice-Chairman; W. Shouldice, Vice-Chairman; Communications Committee—W. H. Powell, Chairman, Cecil Boadway, Technical Vice-

Chairman; Convention Committee—E. A. Washburn, Chairman, Jack Torrance, Technical Vice-Chairman; Employee Relations Committee—J. W. Peart, Chairman, Ray Pfaff, Vice-Chairman; Merchandising Committee—Chas. Phelps, Chairman, O. H. Scott, Vice-Chairman; Papers Committee—G. R. Davis, Chairman, F. G. York, Vice-Chairman; Rates Committee—J. E. Teckoe, Chairman, J. A. Williamson, Vice-Chairman; Regulations Committee—Robert Butter, Chairman, A. A. Kidd, Vice-Chairman; Co-Ordination of Municipal Standards—N. A. Grandfield, Chairman; Membership and Credential Committee—E. A. Washburn, Chairman



# QUEEN CITY CHANGEOVER

**Toronto project will take five years to complete**

**W**ITH about five years of intensive work ahead, Ontario Hydro, on March 7 launched its frequency standardization program in Toronto, the largest city ever scheduled for a complete house-to-house switch from 25 to 60-cycle power.

The huge project was begun in the city's west end, in the Jane-Bloor district. Hydro will move across Toronto over the next five years altering every frequency-sensitive electrical appliance and other items in homes, stores, offices and factories in the city and Leaside—a total of 194,000 services.

Toronto changeover alone represents in work load about a fifth of the total program started over five years ago to convert electrical equipment owned by 940,000 domestic, commercial, and power customers in a 12,000 square-mile area of Southern Ontario. The equipment of over half of these customers had been altered from 25 to 60-cycle operation by the end of February, 1955.

Already seven other major Southern Ontario cities have been changed over entirely to 60 cycles—Windsor, London, Sarnia, Kitchener, Waterloo, Galt, and Stratford—and the changeover is also now well underway in Hamilton, second largest city in the province. In all, 17 cities will be affected by the big operation, largest of its kind ever undertaken.

## **First "Cut"**

The first "cut" in Toronto affected some 147 domestic and commercial customers in an area north of Bloor Street

to just above Nelles Avenue, between Jane Street and Armadale Avenue.

While Ontario Hydro will carry out the actual physical changeover of customers' equipment, Toronto Hydro will work closely with the provincial commission throughout city conversion. The Toronto utility, for instance, is responsible for the planning of changeover sequence and will do most of the electrical engineering connected with changeover, such as conversion of electrical city-owned substations, and switching of the power in the lines from 25 to 60 cycles for each daily customer "cut."

## **1955 Program**

During 1955, the cycle switch will cover a large portion of the west end north of College Street, a big part of the east-end Beaches district, and a portion of the downtown area.

Changeover crews will work in the west end until the end of May, then move downtown where they will convert most of the industrial and commercial customers in the section east of Yonge Street over to Church Street, between College and Esplanade streets. This will be completed by mid-July.

Generally, the program will move in a west to east pattern across the city. Some 6,200 customers in the Beaches district south of Kingston Road between Lee Avenue and Victoria Park Avenue, however, will have equipment converted during the period from mid-July to the third week of September this year. The Beaches area conversion is being carried

out ahead of the remainder of the east end to relieve increasingly heavy loads on 25-cycle distribution and transformation facilities in the area, and to make expansion of these—at considerable cost—unnecessary.

Following completion of this east-end section, Hydro crews will return to the city's west end for the balance of the year, and by September of 1956 changeover will have been finished for the west-end area of the city north of College Street roughly west from Christie Street to the city limits.

The rest of Toronto will be converted according to the following tentative schedule:

1. *Toronto Parkdale*—From November, 1956 to August, 1957. The west-end area approximately south of College Street from Spadina Avenue west to the city limits.

2. *Toronto South-Central*—From 1955 to 1959. The downtown low-voltage network, covering most of the downtown area south of College Street to the lakeshore, between Church Street and University Avenue, will be changed over in sections at different times from 1955 to 1957. Standardization in the rest of the south-central district—roughly south of Bloor Street to the Lakeshore between Spadina Avenue and Parliament Street—will be carried out from July, 1958 to November, 1958, except for Toronto Island which will not be converted until the spring of 1959.

3. *Toronto Central*—From September, 1957, to July, 1958. Includes the area



from just south of Bloor Street north nearly to Eglinton Avenue between Christie Street on the west, and the Don River on the east.

4. *Toronto East*—From December, 1958 to July, 1959. Includes all customers in the area from just east of Parliament Street to the eastern city limits.

5. *Toronto North and Leaside*—From August, 1959 to December, 1959. Includes the entire north end of the city roughly from Mount Pleasant Cemetery to the city limits, and all of Leaside. The latter municipality will be the last area to be changed over.

#### Customer Service

Changeover engineers and technicians will work under H. H. Leeming, Ontario Hydro Director of Frequency Standardization, and will operate from Hydro's A. W. Manby Service Centre in Islington, base for city changeover.

About 120 domestic and commercial city customers will have equipment converted each working day—Monday through Friday.

Most items are altered right on the premises, with the exception of portable clocks and fans, and special appliances which may have to be removed to Hydro workshops.

#### Many Unusual Items

In a city the size of Toronto, conversion planners expect to encounter a bewildering variety of electrical equipment, some of which—like an electrical bridge table—will require special attention from changeover engineers.

Inventory lists that have been made so far in the city's west end and in the Beaches district, show an average of from five to six appliances per home that will have to be changed over to 60 cycles. The general average in the overall Southern Ontario switch has been about five.

#### For "Movers"

Standard 60-cycle is available in most parts of Toronto now for those people who move into 25-cycle sections of the city, but whose equipment is 60 cycle. Toronto Hydro has a duplicate 60-cycle system covering most of the city and Leaside, with the exception of the sections of the west end and the east end Beaches district, where changeover is scheduled for this year.

According to H. J. MacTavish, General Manager, Toronto Hydro, an estimated 45,000 customers having all 60-cycle

equipment will move into remaining 25-cycle portions of the city over the next five years. The duplicate 60-cycle system will allow these customers to get 60-cycle service in advance of general changeover, and save them from having to pay the cost of conversion back to 25 cycles, since Ontario Hydro is not authorized, under existing legislation, to make the change from the higher to the lower frequency.

Mr. MacTavish emphasized that the advance 60-cycle power is primarily for the benefit of the "movers" who already have 60-cycle appliances. Toronto Hydro will not normally supply advance 60-cycle power to customers on 25-cycle service in the city, for instance, just so that they may buy new 60-cycle appliances. "Requests of this kind," he said, "will be referred to Ontario Hydro for study on their individual merit."

#### 60-Cycle Load

Toronto Hydro already serves over a third of its total power load—mostly industrial and commercial—at 60 cycles. At the end of last year, for instance, 194,800 kilowatts out of a total Toronto system

peak load of 490,669 kilowatts was at 60 cycles, or 39.2 percent.

By the end of 1954, power supply at 60 cycles was being used by 3,451 of a total of 28,458 commercial Hydro customers in the city; and by 1,138 of a total of 6,160 power customers. Of a total of 158,897 domestic users, 3,497 were on 60-cycle power.

Practically all new buildings in Toronto have been going in at 60 cycles over the past few years, including apartment houses. This has all been part of Ontario Hydro's scheme—launched about five years ago—to provide 60-cycle power to new industry and commerce in Southern Ontario municipalities, ahead of the general changeover program.

The scheme has resulted in big savings to the Ontario Hydro over the cost of the changeover that would otherwise be required, and customers themselves are in many cases reaping substantial savings on the purchase price of new 60-cycle equipment, as well as profiting from the fact that this equipment is made for a mass market in greater variety, and for a wider range of applications. ●

**TORONTO HYDRO** engineers, left to right, H. B. Little, L. P. Forebare, F. W. Ball, H. J. Chambers, H. E. McBroom and Harry Hyde, watch Ontario Hydro technician Henry Grzeskowiak connecting leads on a 100-horsepower motor during tour of A. W. Manby Service Centre, headquarters for changeover operations in Toronto and Leaside during the next five years. Douglas H. Cook, of Ontario Hydro's Information Division, is shown in the centre background.



# APPROACH TO NUCLEAR POWER

## Ontario Hydro engineer describes Chalk River feasibility studies

**R**ELATIVELY large-scale nuclear power plants are expected to come into operation within the next two or three years.

This fact was revealed in an address to O.M.E.A.-A.M.E.U. delegates at their 46th annual convention in Toronto this year by Harold A. Smith, Ontario Hydro engineer.

Project co-ordinator of an 11-man group carrying out feasibility studies at the Chalk River plant of Atomic Energy of Canada Limited, Mr. Smith also told his audience following a convention luncheon that plants, now in the design stage, are expected to produce economic power in some areas in less than 10 years.

In a carefully worded statement, Mr. Smith—who first joined the Commission in 1940—outlined some of the seemingly insurmountable engineering problems associated, not only with producing electrical energy from nuclear sources, but with producing it at costs competitive with other sources of power.

Chairman Dr. Richard L. Hearn prefaced his introduction to Mr. Smith with the statement that “in order to make adequate plans for the future and to ensure maximum efficiency of operation, Hydro has always endeavored to keep abreast of new developments. In this connection, and with the realization that within a decade we would virtually exhaust our remaining major hydraulic power sites, we started studying the prospects of economic nuclear power.”

Co-operating with Atomic Energy of Canada Limited, the Commission, in 1953, designated a group of Ontario



**HAROLD A. SMITH**  
Project Co-ordinator

Hydro engineers to help form a study group at Chalk River. To lead this group, which also included engineers from other Canadian organizations, the Commission appointed Mr. Smith as project co-ordinator. A graduate of Queen's University in electrical engineering, Mr. Smith was associated with the Commission from 1940 to 1943 when he joined the Royal Canadian Navy. For his work on the design and construction of new naval

radar equipment, he was awarded the M.B.E. He returned to the Commission in 1945 and continued in the Planning Division until his appointment in 1948 as an engineer with the Frequency Standardization Division. In this capacity, he had charge of the development of standardization methods and procedures. In January, 1954 he was transferred to Chalk River.

At the outset of his address, Mr. Smith



referred to the varying opinions expressed on the feasibility and economy of nuclear-electric power.

"Opinions vary from one extreme—that economic nuclear-electric power can be produced in the next two or three years—to the other extreme—that it will not be available for 25 years or more."

On the positive side, the speaker mentioned the fact that numerous nuclear reactors have been constructed and have operated up to 10 years. Some reactors have been adapted to demonstrate the production of electric power in very small amounts, while others have been constructed for power production in ratings up to 5 megawatts, and still others are in an advanced stage of construction in ratings up to 60 MW.

Based on these and other facts, "it is evident that this new source of power is at least potentially competitive with conventional thermo-electric sources for supplying future load growth in electric utility systems," Mr. Smith pointed out.

Referring to Ontario Hydro's interest in the possibility of developing power from nuclear reactors, the speaker recalled that in 1953 the Commission "took advantage of a previous offer of the Government of Canada to co-operate with any interested Canadian utility in the development of nuclear power, and made an initial commitment of funds to the extent of \$200,000 for the purpose."

Thus, three members of the Hydro staff were assigned to a Nuclear Power Group composed of engineering representatives of various companies interested in nuclear power development. At the present time, the Group functions as a section of the A.E.C.L. Engineering Design Division.

The Group came into being in January 1954, when it consisted of six engineers provided by three companies—Canadian-Brazilian Services, Montreal Engineering, and Ontario Hydro. Since that time its staff has increased by five, three being added from Shawinigan Water and Power, Babcock-Wilcox, and British Columbia Electric, and two members of the A.E.C.L. staff who were assigned to full-time work in the Group, the speaker continued. Previous general experience of the staff averages about 12 years per person and includes chemical development engineering, and various electrical and mechanical phases of power system and industrial engineering and design. Only the two engineers provided by

A.E.C.L. have recorded previous experience in reactor design.

Accordingly, informal instruction in elementary nuclear physics, reactor physics and associated engineering problems was provided by A.E.C.L. personnel. This instruction was interspersed freely with periods for study and reading applicable literature. For the most part, the training phase was confined to heavy-water-moderated natural uranium reactors—the type on which most experience has been acquired by Canadian nuclear specialists.

In all, somewhat over six months were spent in this preliminary training phase.

#### Preliminary Design Study

In August, 1954, the Group was assigned the work of preparing a preliminary design of a small nuclear-electric power plant. The design and construction of this plant, scheduled for operation in 1958, represents the first stage of A.E.C.L.'s nuclear power program recently announced by the Federal Government. Although the plant itself is not expected to provide power at costs competitive with present sources, it is believed to be a necessary step towards that goal.

The preliminary design of this plant is intended to include sufficient information for a general assessment of physical and operational characteristics of the plant, the detailed development and design effort required, and an approximate estimate of capital cost. It is expected that this study will be completed sometime in the next two months.

#### Scope of Study

The scope of the preliminary design work was defined by setting restrictions on the capital cost of the plant and on the basic type of reactor to be designed. Essentially, the cost restriction implied an equivalent plant rating of the order of 5 to 20 megawatts. The reactor was restricted to a type employing fuel in the form of rods immersed in heavy water moderator and designed for power production only. Some reasons for selecting this type were:

1. It appears at the present time to be as promising a type as any for the production of economic power in the next decade;

2. It is better suited to Canadian resources than many other types, since natural uranium may be used as fuel;

3. It is likely to require the smallest development program since its technology is better known in this country than other types;

4. It represents the most logical development of Canadian reactor design experience, being the type on which A.E.C.L. has specialized.

A few other restrictions were placed on the study based on previous A.E.C.L. experience and other information. These included the use of natural uranium fuel in the form of a long rod, sheathed in an alloy of zirconium and cooled by pressurized water.

#### Procedure for Study

With the scope of the work defined, it was decided to approach the preliminary design in three stages.

The target for the first stage consisted of establishing an outline specification for the plant. The second stage of the work was aimed at the selection of a suitable physical arrangement for the plant. The third and final stage of the preliminary design study consists of extending the basic design, chosen during the second stage, in sufficient detail to meet the basic requirements of the study. This will include sufficient information to assess the operating characteristics of the plant and its approximate capital cost. It is expected that this cost may be accurate to within 20 percent. No estimate of development costs will be attempted. The preliminary design work was originally scheduled to cover an eight-month period. To date, this schedule has been met reasonably well, the first two stages having been completed, as well as a considerable portion of the final stage.

#### Physical Description

In outlining some of the engineering problems encountered in the design of the plant, Mr. Smith presaged his remarks with a physical description of the plant under consideration.

The plant, he said, might be considered as composed of four main groups of equipment—the reactor proper which generates heat, the primary coolant system which removes the heat and generates steam, the turbo-generator system which converts the heat to electric energy, and the electric station equipment.

The reactor for such a plant might consist of a central cylindrical core some eight feet in diameter and height, composed essentially of numerous uranium rods sheathed with a zirconium alloy and suspended equidistant from each other in a vessel of heavy water moderator. Cooling for the rods might be provided by passing high-velocity pressurized

*(Continued on page 24)*

heavy water along the fuel rods inside a concentric tube. The entire core, possibly surrounded by a neutron reflector of graphite or light water, is enclosed in a high-strength vessel capable of withstanding the coolant pressure. The entire vessel would be surrounded with a thick shield, possibly composed of iron, light water and concrete, to afford protection from lethal radiation from the core. Considerable auxiliary equipment is required for the reactor, including arrangements for replacing highly active spent fuel, for pressurizing the coolant, and for cooling and purifying the moderator.

The primary coolant system acts as the steam boiler for the plant, removing heat from the reactor fuel by circulating the primary coolant through the tubes of a heat exchanger. This, in turn, generates steam from ordinary water on the outlet side.

The remaining components of the plant are similar in nature to those of any steam-electric plant except that the turbo-generator may operate on a saturated steam cycle.

### Engineering Problems

Numerous engineering problems, not found in other types of plant, exist in the nuclear plant.

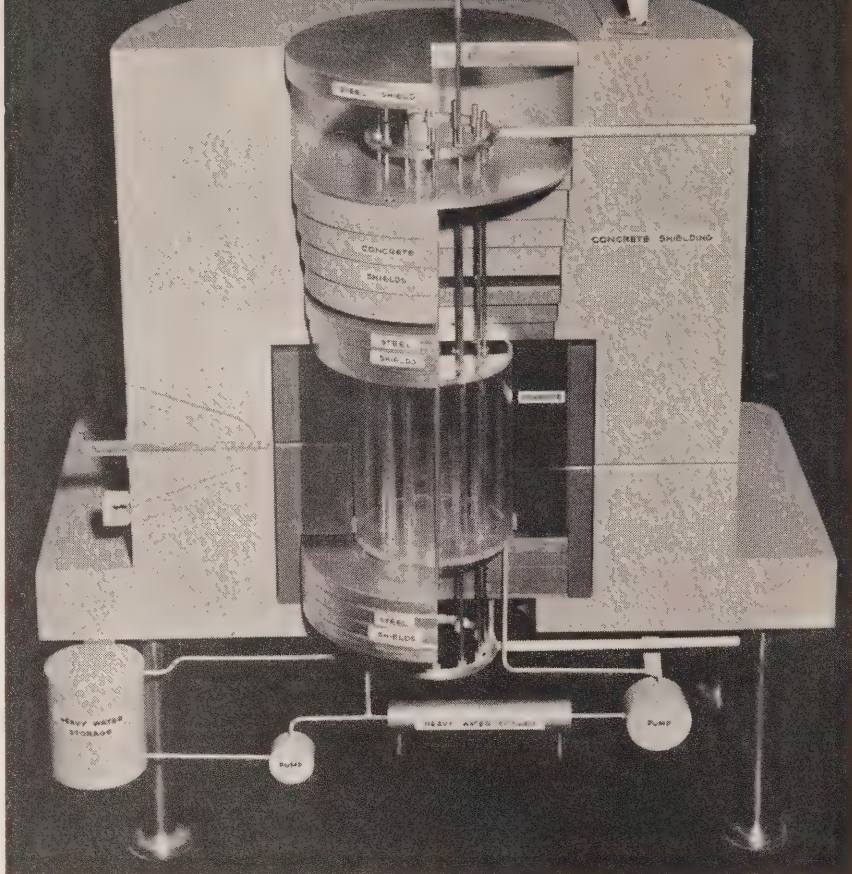
Perhaps the foremost of these is the difficulty of heat removal from the reactor core. This portion of the reactor is distinguished by at least four basic characteristics not found in fossil-fueled heat generating equipment. These are:


1. Two components (in this case uranium fuel and heavy water moderator) are required to produce a self-sustaining chain reaction. These components must be present in certain minimum amounts to form a critical assembly in which the reaction may be sustained and heat released from the fuel;

2. Such a critical assembly is capable of releasing heat at rates and temperature levels far in excess of limiting values set by present-day designs and materials;

3. Any structural materials inserted in the core—for example, to arrange for removal of the heat—require an increase in the dimensions of the critical assembly in an amount much greater than the actual volume of material inserted. This is because such materials absorb neutrons which are the agents of the chain reaction;

4. The materials required for the critical assembly are very expensive.



 **SCALE-SIZE** man standing on top of NRX reactor model, part of a display arranged by Atomic Energy of Canada Ltd. at a convention in Toronto earlier this month, shows the immense thickness of steel, concrete and graphite shields. This unique model stands about 18 inches high.

Thus, one major problem, to put it simply, is that of devising a means for removing heat at a high temperature from a highly-concentrated source, using as little structural material as possible. It is evident that the solution lies in the direction of adopting very high surface heat rates and very high-velocity coolant streams.

Although an actual quantitative consideration of this problem is restricted by security regulations, a rough measure of its magnitude can be made from a few figures published in unclassified literature. For example, on the question of cost, published figures for the cost of heavy water lie in the range of \$60 to \$100 per pound, and for uranium metal in the range of \$20 to \$30 per pound. Making allowance for the relative densities of these materials and for fabrication, the core cost can be shown, on the basis of such unit prices, to be of the order of \$5,000 per cubic foot. It is obviously desirable to make the core as small as possible.

With regard to rate of heat production, a value of 5 kilowatts per cubic inch of fuel gives the order of magnitude of

volume heat rate. If the fuel geometry is considered, such a value implies a surface heat rate between 10 and 20 times that employed in modern boiler design. Thus, the reactor core designer is working in a field in which little, if any, data from experience exist, and must turn to long, and often costly, development and experimental work to obtain such data.

Another difficulty, closely-allied with heat removal, exists in obtaining suitable materials for reactor cores. Since hot uranium, in contact with water, produces a violent chemical reaction, it is necessary to sheath the fuel rods in some other material which does not react. Furthermore, a material with similar characteristics is required to form a channel for the high velocity coolant. This material must be corrosion-resistant to high-temperature water coolant and must have a low rate of absorption of neutrons. These requirements impose severe limitations on the type of material. For instance, stainless steel provides suitable corrosion resistance, but is a high neutron absorber—so high, in fact, that its use in thicknesses greater than a few thousandths of an inch will cause a natural uranium



core to become non-critical, even in enormous sizes. It is generally true that none of the well-known materials is suitable for this purpose. The designer is, therefore, forced again to develop suitable alternatives. One such alternative receiving considerable attention recently is zirconium and its alloys. Unfortunately, this element appears in nature mixed with another metal, the undesirable hafnium, and is expensive to separate. Even non-hafnium-free zirconium has a present market price of the order of \$28 per pound in billet form, although recent long-term United States contracts state a value of about \$15 per pound for reactor grade material.

One engineering problem which involves relatively little development work, but which is an important design problem in the type of reactor under consideration, is that of containment of the pressurized coolant. Two alternatives could be considered: pressure tubes surrounding each fuel element, or a pressure vessel surrounding the entire core. The former carries with it the same difficulties that were mentioned in the case of the fuel sheath, with one additional requirement—the material must exhibit a high strength characteristic. For this reason, the pressure vessel alternative is probably the more practical at present. In this case at least, the designer is on familiar ground in that he is dealing with a known material—steel. However, the design and fabrication of a vessel some 10 to 12 feet in diameter, built to withstand a pressure in the range of 1200 to 2000 pounds per square inch, with provision for inserting and removing scores of fuel rods, is no mean feat.


There is another phase of the nuclear plant which differs sufficiently from the conventional plant to warrant attention. This is the matter of control. In conventional power plants, the primary function of the control system is to adjust plant output to some desired value. The safety aspect has been relegated to relatively simple devices such as governors and blow-off valves. This is possible because the power generating system contains, at any instant, a very small fraction of the total energy it produces in a year. In the case of the nuclear plant, however, the reactor contains a relatively large fraction of the energy it will release over a long period. Furthermore, it is capable, when out of control, of releasing this energy in a very short time. Lastly, at any given time, it contains its products

of combustion in an amount proportional to the energy it has released since its previous fuel charge was inserted. This situation might be considered akin to a steam boiler having half its annual supply of fuel stored within it in such a fashion as to be instantly combustible, as well

as half its annual ash and flue gas production in the form of lethal poisons. With such a situation, it is obvious that the system of plant control must possess characteristics of reliability and precision to a degree not usually found in con

*(Continued on page 4)*



 **DONALD Cameron, Electrical Employers Association, left, watches as A. W. H. Taber, second from left, presents Canadian Electrical Association resuscitation certificate to Gordon Campbell, and a medal and certificate to his father, William Campbell, right, for their work in reviving a Preston P.U.C. employee suffering from electrical shock.**

## LIFE SAVERS

**C**REDITED with saving the life of a fellow worker, three employees of Preston Public Utilities Commission were honored by the Canadian Electrical Association during the joint annual O.M.E.A.-A.M.E.U. convention.

Special awards were made to William Campbell, his son, Gordon, and Ervin Bricker for their quick action in reviving Frank Kreason, Preston P.U.C. Superintendent, after he came in contact with 2,300-volt apparatus at Preston's main substation last November.

Kreason, who had been working on the switchboard, froze to the equipment when contact was made. Instantly realizing the situation, Bricker disconnected the breaker and the stricken man fell unconscious to the floor. Electrical shock had halted his breathing, and he was suffering from burns to his left arm, wrist and forehead.

William Campbell immediately began artificial respiration on Kreason, employing the Schafer Prone Pressure method, being relieved periodically by his son and Bricker. After five minutes Kreason regained consciousness and is today recovering satisfactorily from his serious injuries.

For this action, William Campbell was awarded the Association's resuscitation medal and certificate "for saving a life." Certificates of assistance went to his son and Bricker.

The presentations were made during the final convention luncheon by A. W. H. Taber, retiring President of the A.M.E.U. and Vice-President of the Electrical Employers Association of Ontario, on behalf of the C.E.A. Donald A. Cameron, Secretary-Treasurer and Engineer for the Electrical Employers' Association, announced the awards.—*by A. A. Bolté.*

# In Grateful



**P**ERPETUATING a custom inaugurated in 1954, the Ontario Municipal Electric Association presented long-service awards to 44 of its members at this year's annual convention.

The awards, representing a combined total of 973 years' service as Ontario municipal Hydro or public utilities commissioners, were presented during the convention's main banquet by W. Ross Strike, Q.C., Ontario Hydro's Second Vice-Chairman. This "grateful recognition" of their "contribution to the progress of the municipal Hydro systems" was expressed in framed scrolls which cited their "loyalty to the ideals of our province-wide, publicly-owned hydro-electric systems."

The commissioners honored this year were seated at the "first head table." They entered the banquet hall to the "skirl" of the bagpipes and the warm applause of the large assemblage.

Appropriately enough, Mr. Strike was among those honored this year, receiving his scroll for 21 years' service to Bowmanville Public Utilities Commission from the hands of Lt. Col. A. A. Kennedy.

At the same time he was the recipient of the A.M.E.U. President's Citation. In making the presentation to Mr. Strike, retiring President A. W. H. Taber expressed the association's esteem and gratitude for his "valuable assistance, advice and guidance."

"Despite the many demands on your time, you have never refused to help us,

*(Continued on page 28)*




**W. ROSS STRIKE**, Hydro's Second Vice-Chairman (left, upper photo), received his white carnation and scroll from O.M.E.A. President Lt. Col. A. A. Kennedy signifying 21 years' service to Bowmanville P.U.C. Several long-service commissioners are shown in the lower photo. They occupied a special head table at the convention banquet when the scrolls were presented.




# Recognition

## *O.M.E.A. Presents Scrolls to 44 Long-Service Commissioners*




 EASTERN ONTARIO veterans, Henry Walter, Brockville, left, 21 years, and Dr. J. L. Walsh, Perth, 20 years, examine a scroll.




 ADMIRING a framed award are W. H. Honey, Waterford, left, and N. R. Graham, Hagersville, both 21-year recipients.



 TWO doughty northerners, J. R. Pattison, left, and C. H. Moors, both of Fort William, each with 20-year records, examine text.



 DR. FRED Barron, Paris, left, with 20 years' service, was honored with J. A. Bowman, Ingersoll, who has 22 years.



WESTERN ONTARIO trio, left to right: E. M. Creighton, Listowel, 24 years; J. W. Burns, Southampton, 25 years, and E. G. Kerby, Petrolia, 20 years, also received long service awards.

setting a rare example to others of sincerity and diligence."

Receiving hearty congratulations for 26 years' service each were: J. R. Beaulieu, Penetang; Dr. B. B. Horton, Thornton; J. H. Moffat, Napance, and F. J. Martin, Harrow.

Four other commissioners: J. W. Burns, Southampton; G. M. Faulds, Wardsville; C. K. Merner, New Hamburg, and A. E. MacIntyre, Stratford, were honored for a quarter-century of service to their respective commissions.

Posthumous awards were made to the late Cyrus Flommerfelt, who served as a member of Chippawa P.U.C. for 24 years, and to the late J. J. Weiler, of Baden, who had established a record of 23 years' service. His scroll was received by his son, Roger Weiler.

Also presented with scrolls were: T. A. Andre, Kingston, 22 years; R. S. Austin, Arkona, 22; S. J. Babe, Oshawa, 22; Dr. Fred Barron, Paris, 20; J. A. Bowman, Ingersoll, 22; E. M. Broomfield, Colborne, 22; John Brown, Scarborough Township, 21; H. D. Cleminson, Wellington, 23; E. M. Creighton, Listowel, 24; M. J. Dillon, Thornbury, 22; Walter Dixon, Arthur, 21; W. B. Elliott, St. Catharines, 22; H. G. Fairman, Hastings, 20; N. R. Graham, Hagersville, 21; J. C. Halliday, Thorold, 20; G. B. Henderson, Cannington, 23; W. E. Honey, Waterford, 21; Dr. R. P. Johns, North York, 20; E. G. Kerby, Petrolia, 20; G. D. Lang, St. Thomas, 22; Henry Longhurst, Windermere, 24; C. H. Moors, Fort William, 20; J. D. McInnes, Sudbury, 22; T. C. Odette, Tilbury, 20; J. R. Pattison, Fort William, 20; L. J. Penhale, Exeter, 21; Robt. Reilly, Port Dalhousie, 22; J. E. Schnurr, Neustadt, 22; C. E. Schwartz, Port Elgin, 22; W. F. Sutch, Tillsonburg, 20; Dr. J. L. Walsh, Perth, 20; Henry Walter, Brockville, 21; Wm. Watterson, Welland, 17. The O.M.E.A. also announced that an award for 21 years' service was being forwarded to E. N. Cooper, Meaford. ●



ACTIVE in O.M.E.A. circles for many years, William Watterson, Welland, right, who retired at the end of 1954, was honored for 17 years' service.



ONE of four commissioners honored for 26 years' service this year, F. J. Martin, of Harrow, right, receives Mr. Strike's hearty congratulations.





↑  
C. ODETTE, right, came from Tilbury to accept a long-service scroll awarded in recognition of his 20-year record.



↑  
REPRESENTING an expanding municipality, Dr. R. P. Johns, right, has served on North York Township Hydro Commission for 20 years.



↑  
TILL comparatively youthful, R. S. Austin, of Arkona, right, smilingly accepts his 22-year service scroll from Mr. Strike.



↑  
ANOTHER commissioner with 26 years' service who received an award was J. R. Beaulieu, Chairman of Penetang Water and Light Commission.

# BRITTLE FRACTURES

## British manufacturer gives report on mechanical failures in two generators at Richard L. Hearn Generating Station

**"B**RITTLE fractures" in the forged steel end bells or retaining rings of two generator rotors at Ontario Hydro's Richard L. Hearn Generating Station are believed to have been responsible for the extensive damages to two units at this plant last April.

A summary of a 13,000-word report on the mechanical failures was presented to members of The Engineering Institute of Canada and other prominent engineers by Sir Claude D. Gibb, C.B.E., D.Sc., M.E., F.R.S., Chairman and Managing Director of C. A. Parsons & Co. Ltd., Newcastle-upon-Tyne, England, manufacturers of the heavy equipment, at a meeting in Toronto on February 18.

In his summary, the distinguished British engineer drew "a close parallel between the failure in the air of the Comet jet aircraft and the Toronto rotor end bells."

The report, he said, shows that the failure originated in both instances in the generator rotor which rotates at 1,800 revolutions a minute, and which at full electrical load requires 140,000 horsepower to drive it. This rotor, which is a forging of special quality steel and weighs 78.4 tons, has a large number of slots machined along its length into which are placed heavy coils of a copper silver alloy through which current is passed to create a magnetic field. At the ends of the rotor body, which is 56 inches in diameter and 13 feet long, the heavy coils are held in position against the considerable rotational forces, by forged steel end bells or retaining rings. It was the failure of the end bell at one end of the rotor which caused the disasters.

These end bells are 58½ inches in diameter, approximately 3 inches thick and are 21 inches long. They are made

of a special alloy steel of high strength and contain considerable amounts of nickel, manganese and chromium. The chemical composition was chosen so that the steel would not be magnetic and was precisely the same type of steel that has been used by a number of generator manufacturers. This special steel has many advantages to the electrical designer, but, like many things in engineering, also has some disadvantages.

C. A. Parsons had in service for many years, a large number of turbo-generators of slightly smaller size but running at 3,000 revolutions a minute, and the end bells of these generators employed the same material and operated under the same stress as the bells which failed. No trouble of any kind had been or has yet been experienced with those other end bells. Since the failures in Toronto, a number of those equally stressed bells have been taken out of service and examined, without defect of any kind being found. Some have been replaced to enable those removed to be tested to destruction. Those tests to destruction showed an adequate safety factor in accordance with design expectations.

### Special Testing Apparatus

The Parsons research workers devised special testing apparatus which enabled their engineers for the first time to simulate in the laboratory, conditions which would arise when the rotor was operating at speed under its normal condition looking after the peak loads on an electrical system such as that of Ontario Hydro, where the great bulk of the electricity is generated from waterpower. By applying oil pressures exceeding 10,000 pounds per square inch inside these end bells in massive testing equipment, the Parsons engineers were able to reproduce almost

exactly the type of failure which occurred in the running machines last April. But they were only able to reproduce sudden failures in two instances out of the large number tested.

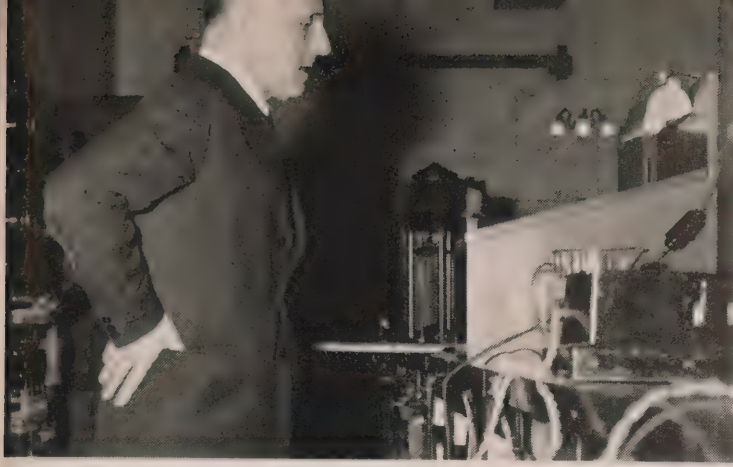
When end bells were oil-pressure tested a large number of times by building up a high pressure and then releasing it, failure occurred at a pressure only two-thirds of that required to fail them by a single pressure application. The number of loading cycles to produce failure was only a little over a hundred, whereas theory and small-scale laboratory tests had indicated scores of thousands of cycles would be required. The cost of each load cycle test was several thousand dollars and over 20 of these have already been made and many more are yet to be carried out.

The end bells which failed in Toronto were bigger in diameter and were thicker than those, otherwise similar bells, which have given such excellent results over many years. Because of the bigger size and thickness of the bells, holes which were drilled through them to cool the rotor windings, had a somewhat greater effect than expected in reducing their strength. Again because of the greater thickness, the residual stresses locked in the material after forging were probably greater than previously experienced. Further, the varying temperature which dealing with peak loads brought about, caused some increase of stress, and these all added up to give a resultant stress approaching that which the repeated oil pressure tests had shown could produce failure.

### Occasional Failures

Some of the rotor bells tested failed quietly by a small crack which reduced the oil pressure but two of them failed





**SIR CLAUDE D. GIBB** during presentation of 13,000-word report before members of The Engineering Institute of Canada and other prominent engineers.

completely and suddenly. There have been occasional failures of this nature in high pressure gas mains, in welded ships, and in large storage vessels, which metallurgists have called "brittle fractures." This phenomenon even now is not completely understood and it is likely that the two end bells which failed in service could be said to have had "brittle fractures." But, even if the true mechanism of brittle failures is not completely understood, the prevention of their recurrence can always be assured. This is by the elimination of any feature which can cause a concentration of stress, by using, if possible, a more ductile material which also has a greater notch toughness, and by reducing the general level of stress in normal service. All those changes have been made in the replaced end bells of the Toronto generators.

"It can be said with certainty that there was no single factor which caused the failures, but that a combination of factors, never previously experienced together, led to a resultant stress which, repeated a sufficient number of times, brought about a failure at one end whilst the other and almost identical end was quite unaffected and in perfect condition," Sir Claude told his listeners.

The report on the very extensive investigations is a valuable and highly scientific document of some 13,000 words and a large number of micrographs and test results which will be of great value to generator designers throughout the world.

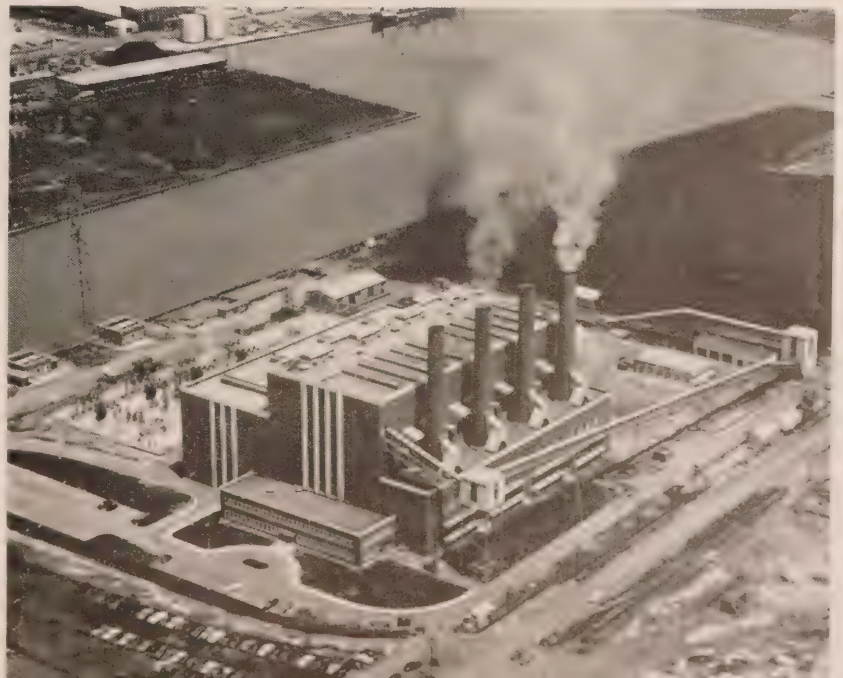
It is in the tradition of the late Sir Charles Parsons that this information is given to the world for the advancement of engineering science, he stated, for as the author of the report said, "progress is made by solving the problems resulting from the making of progress."



**BLACKENED wall, twisted and broken equipment, indicate the damage to one of the two units at the Richard L. Hearn Generating Station in which serious mechanical failures occurred last April.**



**AERIAL view of the Richard L. Hearn Generating Station on Toronto's waterfront. With an installed capacity of 536,000 hp. at 60 cycles, it is Canada's largest fuel-electric station.**





**A. W. H. TABER**  
A.M.E.U. President

## Efforts of Ontario Hydro in expanding generating facilities lauded by A.M.E.U. President

**I**N MEETING the demands for power as they have occurred, the municipal electrical utilities of the province can rightfully enjoy a feeling of pride, President Arthur W. H. Taber, P.Eng., Fort William, told delegates at the annual convention of the Association of Municipal Electrical Utilities held recently in Toronto. Each utility, in almost every instance, has found it possible to have the electrical supply ready and waiting for the customer to receive it, he said.

Of great assistance was the outstanding job done by Ontario Hydro in expanding its generating facilities to meet the increasing requirements. The leadership provided by the late Robert H. Saunders was that type of leadership which inspired his associates and his staff to carry out an expansion program for which there is no comparison, Mr. Taber stated.

In reporting on his stewardship, Mr. Taber said that the various A.M.E.U. committees held 43 meetings during the year, while the A.M.E.U. participated in nine O.M.E.A. meetings and held 14 district meetings.

"The need for an association such as ours was realized in 1909," said the popular president. "If it was necessary at that time, then how much more essential is its existence today, for, as our loads have increased, so, in like proportion, has the complexity of our problems increased."

"The delivery of the power to its point of use by the customer involves substation facilities," he continued, "usually one or more stages of voltage transformation, and also transmission. Each of these divisions of our electrical system requires constant attention, in order that no link in the chain will be unable to carry its load as required. It is here that the development of our municipal standards of design and construction can and will be of the greatest assistance. It is so important that our planning be well and wisely laid. Our substations must be so designed and located as to adapt themselves to continued load growth and meet constantly-increasing densities."

### Underground Distribution

The A.M.E.U. President told the assembled delegates that increasing attention must be given to the question of placing more distribution facilities underground. Public opinion is developing rapidly along this line and the utilities must be ready to accede to this demand. The larger cities have a considerable

# Municipalities Measuring Up



portion of their facilities located underground along the principal thoroughfares and a few of the new residential areas have underground distribution, but this, Mr. Taber stated, is only a token offering and not enough to satisfy the public demand. The speaker felt certain this work of providing underground distribution facilities could be greatly expanded without seriously increasing rates.

Referring to the quality of service, Mr. Taber said that what was generally acceptable a few years ago would not be very much use to today's customers.

"I refer to the minimum and maximum voltage maintained during the full load and light load periods, to the voltage fluctuations resulting from the intermittently applied load, and to the permissible unbalance in phase loadings, etc. New types of industrial apparatus, and domestic and commercial appliances are constantly appearing in use, demanding a much more exacting quality of service. However, with the full co-operation of the designers and manufacturers of this electrical equipment, we can meet all of these requirements, I am sure."

What has been the resultant cost, he asked, of the wise planning that, up to this point, has enabled the utilities to meet the demand for power as needed, and to provide suitable substations and distribution facilities to meet existing loads and to be adaptable to future loads?

If local utilities have designed and constructed well, then they should not experience difficulty as far as cost is concerned. Losses will be at a minimum, maintenance costs will be in line, and they should be able to obtain the maximum utilization of capital expended.

"However, we still must see to it that our utility is efficiently administered," he advised. "Here I would like to stress the growing need for giving the utmost attention to our employee relations. This is, in my opinion, the most difficult single phase of our operations today. Most of our other problems can be solved by the application of some known formula or calculated by means of some equation, but not so with this problem. I think we must set it up as our first concern in our operations."

#### Engineering Feat

Mr. Taber spoke glowingly of the initiation of the St. Lawrence Power Project and the fact that seven units of the Sir Adam Beck-Niagara Generating Station No. 2 came into operation in 1954, "an engineering feat of which not only Ontario but all of Canada is proud." He also congratulated several municipal commissions which officially opened new utility buildings during the year. These new buildings reflect great credit on the municipalities, he said.

The A.M.E.U. President suggested to the incoming executive that it give consideration to the editing of a bi-monthly or quarterly bulletin containing details concerning the problems being currently considered by the various committees. Such a publication could be forwarded to all members, and would provide them

*(Continued on page 34)*

## Among the Speakers



W. R. MATHIESON

A.M.E.U. Secretary-Treasurer



J. E. TECKOE, JR.


Windsor

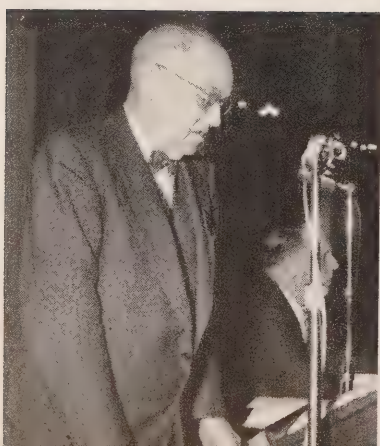
# Among the Speakers




RONALD HARRISON   
Scarborough Township



E. A. WASHBURN   
Stratford



 J. W. PEART  
St. Thomas

with a closer knowledge of the operations of the A.M.E.U.

"Before closing," said the President, "I wish to express our sincere gratitude to Dr. Hearn, Mr. Strike, to Mr. Manby, and to all other Ontario Hydro representatives who have so greatly assisted us during the past year. It has been truly a pleasure working with them. They have always taken a keen interest in our endeavors, and they have been willing and ready to offer counsel and assistance in whatever form it was required."

Mr. Taber also expressed appreciation to Lt. Col. A. A. Kennedy, President of the O.M.E.A., and his executive for the very fine spirit of co-operation manifested by them at all times throughout the year.

"I know you would all wish me to say 'thanks' to our secretary, Mr. Mathieson, for another year of most efficient service to our association. 'Ron', as he is better known to all of us, has been doing a big job for this association. The work is continually increasing, yet he gets it done, and in a manner which is of the utmost satisfaction to all of us."

## Employee Relations

Noting that an increasing amount of information is being requested by member municipalities, J. W. Peart, St. Thomas, Chairman of the Employee Relations Committee, reported that the committee felt additional service might be provided in making available the services of an expert consultant on labor problems and working agreements. Three meetings of the committee had formulated a tentative plan, providing for the following service: (1) up-to-date information at all times with respect to labor conditions; (2) professional analysis and comparisons of wages and salaries; (3) the resultant prestige of expert advice in negotiations; (4) consultant service for any municipality during negotiations with employees, by payment of a fee additional to that required of all members.

Should the plan be adopted, Mr. Peart reported, it would be necessary to make a special charge for the service. The committee would forward particulars of the plan to members in due course. Estimates of the annual expense involved would be indicated in this outline. Mr. Peart asked for very careful consideration of the plan. A number of municipalities already had incurred rather substantial expense in accumulating adequate comparative data regarding working agreements, the speaker pointed out.

Surveys of wage rates and working conditions, he reported, were carried out in 77 Hydro municipalities at specific times in 1954. A total of 44 of these had populations over 10,000. The trend of wage rates during 1954 was still upward, he reported. Increases ranging between 4½ percent and 5 percent were noted in the two leading classifications of linemen and switchboard operators. Of 36 municipalities surveyed last April, with populations over 10,000, there were 28 working agreements in force, and eight municipalities reporting no working agreement. Of the 28 which had agreements, 23 of these agreements were with trade unions and five were with employees' associations.



E. A. Washburn, Stratford, Chairman of the Communications Committee, reported that the committee intends to carry on the point-to-point radio communications program on which it has given advice and guidance through the years. The committee is studying the feasibility of renting telephone circuits for use in voice communications, totalizing systems and supervisory control systems. He said there was, at present, a difference of opinion among members of the committee as to the size of municipality which should consider the installation of supervisory control, the number and types of devices which should be controlled, etc. For instance, some members feel that only in the case of a very large city would it be practical to install equipment which would enable circuit breakers to be operated from a central point. However, most members feel that a totalizing system, and a system of indication would be very beneficial in any municipality having several substations.

### Accident Prevention

Ronald Harrison, Scarborough Township, Chairman of the Accident Prevention and Health Committee, presented a comprehensive report on the work of this committee. Those utilities operating under Schedule 2 of the Workmen's Compensation Act, and who make no financial contribution toward the cost of operation of the Electrical Employers Association, may soon be offered a plan whereby they would be able to obtain the services of this safety association on a 'cost-of-service' basis. Among A.M.E.U. members, 76 percent are also members of the Electrical Employers Association.

"Your committee is of the opinion," said Mr. Harrison, "that the accident prevention work for the utilities can best be carried out by the E.E.A., which operates under the authority of the Workmen's Compensation Act. It hopes to be able to include in its activities utilities operating under Schedule 1, as well as Schedule 2."

### Rates Committee

Committee activities during 1954 were devoted mainly towards revisions in the domestic, commercial and power resale rate structures, reported J. E. Teckoe, Jr., Windsor, Chairman of the Rates Committee. The studies indicate serious and unjustifiable differences in customer costs, and the need for more realistic rate structures is generally apparent. Various proposals were studied, and, while the committee had no definite recommendations to present at the meeting, it is hopeful that, within a few months, rate structures in three major classifications will be developed that will more adequately meet present-day conditions and those which may be reasonably anticipated in the foreseeable future.

Amendments to the A.M.E.U. Constitution were presented and approved after considerable discussion.

Concluding this session, a rose bowl and framed scroll were presented to retiring President Taber by Immediate Past President Norman A. Grandfield of Galt.—by A. H. Brown.



OUTSTANDING assistance brought W. Ross Strike, Hydro's Second Vice-Chairman, left, the A.M.E.U. President's Citation, presented by A. W. H. T.



RECOGNIZING his services to the A.M.E.U., Past President N. A. Grandfield, left, presents rose-bowl and a framed scroll to retiring President Taber.

# WILL PACE HYDRO

**A**LTHOUGH the Power Authority of the State of New York is undertaking a power development program for the first time in its 24-year history, it expects to keep pace with Ontario Hydro on the construction and completion of its phase of the St. Lawrence Power Project, the Authority's General Manager, Colonel William S. Chapin told delegates at the recent joint O.M.E.A. - A.M.E.U. convention.

Citing the fine working arrangement on the project existing between Ontario Hydro and the Authority, Colonel Chapin said that, "together with Ontario Hydro we shall have at least some of the generators spinning before the end of 1958."

"We, in the New York State Power Authority, consider ourselves most fortunate in having Ontario Hydro as our partner on the project," he told the convention. "It is an organization of outstanding accomplishment, and I am happy to state that our relationships have been most cordial from the beginning."

Paying tribute to the late Hydro Chairman Robert H. Saunders, Colonel Chapin said his loss was a "serious blow to us as well as to you." He added his assurance, however, that the St. Lawrence project would be carried on ably by Hydro's new Chairman, Dr. Richard L. Hearn.

The speaker gave the convention a brief picture of the Authority, its organization and history, particularly with reference to the St. Lawrence project.

He said the Authority, which is a public corporation and a political subdivision of New York State, consists of five trustees appointed by the Governor of the State with the advice and consent of the Senate. It is a non-profit organization and must obtain only sufficient revenues to pay for operation, maintenance, interest, and amortization of its bond issues.

The Authority, which was created in 1931, was re-organized in March of 1954, after the Governor of New York State asked Robert Moses to enter the picture and set wheels in motion to carry out New York's share of the St. Lawrence

Power Project. Mr. Moses was made Chairman, and offices were established in New York City, with a small, full-time staff.

## Construction Progress

Outlining his Authority's progress on the project, the speaker said that by mid-summer of this year the bulk of the work, including much of the channel excavation, should be under contract.

Work is now underway on cofferdams, temporary and permanent bridges to Barnhart Island, and a railroad running to the site, and awards have been made for concrete aggregates, powerhouse turbines, generators, and construction power equipment. By mid-April, the Authority expects to be ready to award the contract for the New York half of the powerhouse.

"We feel that we have made real progress since work began last August 10," Colonel Chapin declared, "and though our schedule is tight, considering the difficulties and magnitude of the work, we believe it can be maintained."

## State Park

Speaking of the rehabilitation and landscaping work that will be carried out on the New York side of the river, he said plans prepared by the Authority call for a park in the area, which will be known as the St. Lawrence River State Park. "It will be one of the great park and conservation attractions of the state," he declared.

The general plans include the moving of homes and cottages on the river, and the provision of a landscaped approach to the power facilities. Wherever possible, the demolition of good, movable homes will be avoided.

"I have recited the facts of our progress," Colonel Chapin concluded, "not in a spirit of boastfulness, but rather to assure you that we do not propose to be responsible for further delays in harnessing the St. Lawrence River. I am sure too, that the final working arrangement we have with the Ontario Hydro will continue throughout the life of the project."—by Allan Jones.

## SUCCESSFUL YEAR

(Continued from page 11)

was 700,901, or 82,334 more than the preceding year. Of the 112,280 customers changed over during the year, about 20 percent were converted when they moved from a 25-cycle to a 60-cycle area.

The policy of executing agreements with manufacturers in making certain dual-frequency equipment was continued by the Commission, he stated.

Dealing with other aspects of Hydro's administration, Mr. Manby said that in all divisions of the Commission's affairs a work schedule is being organized to accomplish the maximum amount without the necessity of expanding staff to unreasonable proportions. He pointed out, however, that with continued expansion of Hydro business, some increase in personnel was experienced last year.

## Information Division

Speaking specifically of the Information Division, he explained that it performs far more than a mere publicity function.

"In addition to the Director and the liaison officers who carried out special functions for the late Chairman," Mr. Manby said, "the Division has five departments, one responsible for all contacts with customers regarding the varied aspects of frequency standardization; an Editorial Department responsible for certain regular publications of the Commission, and for the release of innumerable items of information; a Graphic Department which performs a useful service to every division of the Commission with regard to display materials and progress photographs of developments under construction; a Services Department to provide guides and commentators for conducted tours at Hydro properties, and a department to administer the Division's affairs.

"All of these functions are essential to a large organization such as ours," he continued, "and their performance, even if not undertaken by the Information Division, would still be a legitimate and reasonable charge to the cost of operations."

Mr. Manby concluded his address by reporting that the Commission's investment in fixed assets was increased during 1954 by a net amount of approximately \$115,000,000, bringing assets under administration at the end of the year to approximately \$1,470,000,000.—by A. A. Bolté.





## DEWATERING DEMONSTRATION

**R**EPRESENTATIVES of Canadian and United States companies which may be interested in tendering on construction of the Long Sault Dam, associated with the St. Lawrence Power Project, visited Ontario Hydro's A. W. Manby Service Centre, Islington, near Toronto, on March 3. Object of the visit was to witness a demonstration of the dewatering and closure of the Long Sault Dam. Here Donald G. Harkness, Hydro hydraulic engineer, right, explains the function of the 13 diversion sluices of the Long Sault Dam to Asa George of the Power Authority of the State of New York. Standing, left to right, are Frank J. Matejka, Power Project Manager for the Authority's engineers, Uhl, Hall & Rich, of Massena; Henry B. Taliaferro, also of this company, and Hydro Generation Engineer, Edward T. Ireson.

## "TOM, DICK AND HARRY"

(Continued from page 10)

list of repeaters who appear to deem it a feat of distinction to have their electric service cut off every month or so. Even these customers should, in my opinion, receive as much sympathetic treatment as possible, and every effort should be made to avoid these cut-offs which are costly for both the customer and the utility."

Having discussed the habitually delinquent customer, Mr. Strike spoke about the Harry who is not in that class, but who has not paid his bill.

"Here," he cautioned, "we should tread softly and very carefully because perhaps the ice is not as safe as it appears. There might be many good or not so good reasons why the bill has not been paid."

Considerable damage can be done to a home where electric service is discontinued arbitrarily, Mr. Strike asserted. Sympathetic inquiries should be made to ascertain the reasons, the speaker continued, urging delegates to be sure that their collection of overdue accounts is not just a routine affair.

Discussing the expansion of most local utilities with more customers and bigger staffs, he suggested that the utility operates successfully and smoothly only when its policies are interpreted by the staff in an appropriate manner.

He further suggested that more utility personnel be invited to attend commission meetings where, through listening to policy being discussed and formulated, they can become familiar with its background. This is very important if uniform interpretation and application of policy decisions is the aim.

"It would also give senior staff a greater sense of responsibility and allow management to delegate authority further down the line, and have the added advantage of giving better training to those slated for promotion."

Mr. Strike concluded by revealing that Ontario Hydro intends to adopt the procedure of having Ontario Hydro assistant general managers attend Commission meetings regularly, and commended this idea to the delegates for their serious consideration. •

## 7,788 Red Seals

WITH home-building active across Ontario, and continued promotion by the Electric Service League of Ontario producing desirable results, Bertram Merson, Chairman of Toronto Hydro, reported on behalf of the League at the joint annual O.M.E.A. - A.M.E.U. convention this year that 7,788 Red Seals were affixed last year to the service boxes of "homes where modern electrical living can now be enjoyed to the full."

This, he said, was a new record of certifications for a single year. In addition, 4,492 other homes, which will ultimately bear the symbol of adequate wiring, are on the League's list of "pending."

"Most of the progress is recorded from the western areas of the province," reported Mr. Merson. "This is especially true around London and Sarnia where the local commissions have shown real interest. The Toronto area, owing to its many years of Red Seal background, also has been a fruitful field. In the eastern part of the province, however, the results have not been good, and until more local commissions in that area give lead and assistance, we cannot look for much improvement."

Mr. Merson's report expressed appreciation of the full support given the League by Ontario Hydro, singling out for special commendation several of Hydro's regional officials for their continued assistance. In a broader sense, too, the Canadian Adequate Wiring Bureau has, through its literature, advertising, and other promotion material, done its share in the field of adequate wiring, the speaker pointed out.

Mr. Merson also indicated that recent developments have opened up a new and broader field of opportunity for the work of the League. Under the home improvement and modernization regulations of the National Housing Act, loans up to \$2,500 may be authorized through the chartered banks.

### Wiring Below Standards

"It needs no great strain on one's imagination," he continued, "to realize that there are tens of thousands of homes in this province where the wiring is well below Red Seal standards. Many such homes were built before electrical living, as we know it today, was even considered. It is in this type of home that people try to use modern appliances and the wiring will not carry the load. When

the fuses blow, the local Hydro office gets the trouble call and sometimes the blame."

The report estimated that about 80 percent of the existing homes in Ontario are not adequately wired. These customers are not new people coming on to the load of a local commission. They are customers of many years' standing, and the local commission's relationships with most of them were established many years ago. Therefore, they should be easy to approach, and would welcome advice and suggestions on providing adequate wiring.



**BERTRAM MERSON**  
Toronto

Local commissions can assist by distributing Electric Service League literature, and making staff members familiar with Red Seal requirements. Every house built or rewired to League standards eliminates a possible trouble-spot. Such rewiring programs can be financed through the facilities of the N.H.A., or through deferred payment plans arranged with members of the Electrical Contractors' Association.

In addition to emphasizing the need for employee education in regard to League requirements, Mr. Merson recommended that local commissions help publicize the League by carrying the Red Seal on its Hydro bills. Special engravings will be made available by the League upon application. Films suitable for presentation to service clubs and other groups can be obtained through the office of the League at 4 Carlton Street, Toronto.

"Adequate wiring," said Mr. Merson in concluding the League's report, "is something more than just a wire or

current selling proposition. Adequate wiring, for which the Red Seal is the symbol, assures that electrical customers can enjoy to the full all the benefits and pleasure of modern electrical living without the hazards and inconveniences which accompany overloading."

Making the advantages properly known requires the co-operation and assistance of every local commission. Formerly the greatest need was in communities where numbers of new houses were being built, but today, the recent changes under the home improvement regulations make every community a potential field of service to the League. Therefore, all member commissions of the O.M.E.A. now have an opportunity to do their part in furthering the work they asked Ontario Hydro to sponsor, Mr. Merson said.—by A. H. Brown.

## Standards Report

STATING that the efforts of M. J. McHenry, who was appointed Co-ordinating Officer by Ontario Hydro last year, had contributed largely to the excellent progress made during 1954, N. A. Grandfield, Galt, presented the report of the Standards Committee to the joint session of the O.M.E.A.-A.M.E.U. Mr. Grandfield reported that the committee made considerable progress towards its goal of producing a guide of recommended standard practices in the design, construction, and operation of municipal systems.

The Co-ordinating Committee was formed during the past year, reporting to and directed by the A.M.E.U. executive, in order to improve the correlation of the efforts of all the sub-committees. The working sub-committees were continued, as in the past years, with some changes in personnel due to the nature of the work involved, and all committees reported satisfactory progress.

Chairmen of these sub-committees were as follows: Overhead, G. L. Lillie, Toronto Hydro; Underground, J. G. Sutherland, Hamilton Hydro; Distribution and Design, including stations, A. L. Furanna, London P.U.C.

"We should thank these men for the contribution of their personal time and effort," reported Mr. Grandfield, "and also express our appreciation to the systems that they represent. Their jobs have been lengthy and arduous, at no small sacrifice. I would like also to record our appreciation to the other 30-odd members of the committees, representing the small,





**N. A. GRANDFIELD**  
Galt

medium and large municipalities in our system, and the technical departments of Ontario Hydro for their work."

The Co-ordinating Committee reached an agreement that standards for Overhead, Underground and Station Construction should take the form of a guide for construction, and should not be considered as detailed specifications. All work, therefore, has proceeded on this basis, and with the objective of having this complete guide assembled, edited and issued to the municipal systems in sufficient time for the A.M.E.U. meeting in June, 1955, at Windsor. According to present plans, this guide will be issued in loose-leaf ring binders, and in a form which will permit revisions and additions as required.

"We of your Standards Committee," said Mr. Grandfield, "believe that uniformity and standardization of practices throughout our system, where feasible, would improve the overall operation, and could result in actual cost reductions."

"These factors, however, do not outweigh the benefits received from the free exchange of experience and knowledge, and the publication of carefully-considered information for use at all levels of utility operation."

Throughout the last several years, drafts of proposed practices have been presented to the membership of the A.M.E.U. for discussion at the summer conferences. The suggestions for amendments and additions have been carefully considered by the committees, and it is hoped that, by June, an initial publication will be presented for adoption by the membership, he stated in conclusion.—*by A. H. Brown.*

## Pension Plan Progress

AT the end of 1954, a total of 124 municipalities were participating and \$23,287,780 in life insurance benefits was in force in the Municipal Hydro-Electric Pension and Insurance Plan. In submitting the annual report of the directors of the Plan at the joint O.M.E.A.-A.M.E.U. annual convention this year, Chairman P. R. Locke, St. Thomas, said the number of employees participating was 5,677, while 26 municipalities were included in the Supplementary Plan.

The number of death claims to December 31, 1954, was 664, for a total of \$1,958,010, while the amount of employees' income annuity contributions refunded was \$623,913.

The Plan has again been broadened by another optional clause, which provides for its integration with government old age pensions. Under this option, instead of having only the pension payable under the Plan from retirement age to 70, the government pension may, in effect, be merged with it, and a level lifetime income be assured to pensioners from the date of retirement.



**P. R. LOCKE**  
St. Thomas

During 1954, the committee continued its policy of addressing O.M.E.A. district conventions. It was also grateful for the "invaluable service" extended by Ontario Hydro officials, both at head office and in the regions.

The committee visited commissions during the year in all parts of the province. In many localities, a member of the staff has been appointed to whom literature can be sent for distribution,

and it is hoped this practice will grow. Arrangements were completed also with the Confederation Life Association, which administers the Plan on behalf of the underwriting companies, for one of its staff to visit the officials of each commission within the pension group for the purpose of familiarizing them with its workings and benefits.

### New Employees

The committee was concerned, the report said, by the number of commissions failing to report their "new" permanent employees, thereby making them eligible for pension and insurance.—*by A. H. Brown.*

## DR. RICHARD L. HEARN NAMED HYDRO CHAIRMAN

*(Continued from page 3)*

1947, when he was named Director of Operations, being appointed Deputy Assistant General Manager—Administration in 1953.

### E. H. Banks

E. H. Banks, Assistant General Manager and Comptroller, was born in Wolverhampton, England. Mr. Banks obtained his degree as Chartered Accountant from McGill University, Montreal, and subsequently served with P. S. Ross & Sons, Montreal; Defence Industries Limited; and Atlas Steels Limited. He joined the Commission in 1947 as Comptroller.

### John Dibblee

John Dibblee, Assistant General Manager—Personnel, was born in Woodstock, New Brunswick, and graduated from the University of Toronto as a Bachelor of Applied Science. He joined Hydro in 1917 and in the early years served in the Operations Division. He was subsequently appointed Assistant Chief Engineer and later Chief Engineer—Operations, serving in that position until 1947 when he was appointed Manager of Personnel.

### Lorne R. McDonald

Lorne R. McDonald, Q.C., newly appointed Counsel, is a native of Hamilton, Ontario. Called to the Bar of Ontario in 1927, Mr. McDonald was appointed a King's Counsel in 1948 and has had wide experience in the legal profession.

## STEADY GROWTH

(Continued from page 17)

6. Resolution requesting Ontario Hydro to continue making available Hydro 1500-hour long-life lamps. The Commission said that the full range of these lamps would continue to be available to the municipalities.

7. Resolution requesting the Commission to seek legislation which would permit local commissions to establish equitable rates on cost accounts such as street lighting, water works, etc. The Commission is now preparing a brief to be presented to the Ontario Legislature on the matter.

8. Resolution requesting the Commission to permit loss-of-time pay to local commissioners attending conventions pertaining to the operation of their Hydro utilities. The Commission agreed that the commissioners should not suffer by actual loss due to their service on the Hydro utility, and requested the board of directors to recommend an amount of compensation. The board has advised the Municipal Accounting Department of the Commission that the loss-of-time compensation be the actual out-of-pocket loss, in no case to exceed \$20.00 per day.

9. Resolution requesting Ontario Hydro to seek legislation establishing some degree of uniformity regarding customer deposits. The Commission proposed to set the matter aside until there appears to be some uniformity of opinion on the subject.

10. Resolution requesting that legislation be sought from the Ontario Government making unions a legal entity. The resolution has been acknowledged by the Prime Minister and the Minister of Labor.—by *Allan Jones*.

## KEY ROLE

(Continued from page 12)

are the remedial works being built in the Niagara River upon the recommendation of the International Joint Commission. Under the terms of the 1950 treaty between Canada and the United States which made possible the Sir Adam Beck development, the cost of these works is to be shared equally between the two countries. Actual construction is being done by Ontario Hydro and the United States Corps of Engineers.

As construction work at Niagara con-

tracts, there will be an expansion of work along the St. Lawrence, the speaker continued.

"The handful of men employed on preliminary work for the St. Lawrence project at the beginning of 1954 had grown to a sizeable construction force by the end of the year," he stated.

The power project is, of course, a separate undertaking from the seaway, but the joint use of the river by the two projects requires that they be completely co-ordinated in planning, construction, and operation. The seaway is being built by the Seaway Authorities created by the Canadian and United States Governments, while the power project is being built by Ontario Hydro and the Power Authority of the State of New York. The power project is subject to approval by the International Joint Commission and to the jurisdiction of a special Board of Engineers appointed by the two Governments. This board is required to approve all plans and to inspect all the work done.

### Dependable Flow

The St. Lawrence River with its large, very dependable flow is one of the most suitable rivers in the world for hydro-electric development. Between Lake Ontario and Lake St. Francis the river falls 92 feet; the power project will concentrate as much of this fall as can economically be developed. At the powerhouse, where the water will be shared between Ontario Hydro and the Power Authority, each entity will put in 16 generating units.

"The units in our powerhouse will have an installed capacity of 900,000 kilowatts and will produce over 6 billion kilowatt-hours, or about one-third of the total energy generated and purchased last year," Dr. Holden pointed out.

The cost of constructing this \$600 million power development is to be shared between Ontario Hydro and the Power Authority of New York State. It may be said in broad general terms that direction of the construction work will be divided equally between the parties and that each party will handle the work on its own side of the boundary.

### Access Tunnels

The cofferdams for the Ontario Hydro powerhouse are now under construction and Commission forces are completing two access tunnels under the Cornwall canal. On the American side of the river, access roads and bridges are being

built. By the summer, construction work will be in full swing. The turbines and generators for both powerhouses have been ordered and "we expect that the contracts for the powerhouses will be let this spring," Dr. Holden stated.

While construction of both halves of the powerhouse will go ahead simultaneously, the Long Sault and the Iroquois dams are each to be built in two sections. At Long Sault the sequence of construction is complicated and involves cofferdamming and diversion cuts across Long Sault Island.

"Present plans call for the closure of the Long Sault dam in 1958 and for the first units to produce power in the fall of that year. The remaining units will be brought in throughout 1959 and the first half of 1960."

The completion of the St. Lawrence Power Project will bring the capacity of the Southern Ontario System to 4½ million kilowatts, just three times the capacity in 1945. In this, the sixteenth power source to be added to its systems since the end of the war, Ontario Hydro is developing the last major hydro-electric site in southern Ontario.

Like its great predecessors on the Niagara and Ottawa Rivers, the St. Lawrence Power Project "will stand as a monument to those men whose vision, over half a century, has conceived and carried out the development and integration of the water-power resources of Ontario," the speaker stated in concluding his address.—by *Frank Wood*.

## NUCLEAR POWER

(Continued from page 25)

ventional systems. Also, it must be fast-acting, since even a very short interruption or reduction of coolant flow to the fuel rods will result in rapid temperature rises. These requirements, along with the necessity of monitoring each fuel rod to detect trouble, pose considerable difficulties for the designer.

There are numerous other engineering and operational problems in connection with the development of a nuclear-electric plant. These include such important ones as matching reactor operational characteristics of start-up and shutdown to system requirements, processing of spent fuel for re-use, and disposal of fission products to mention only a few. All of these require much experimental work and operating experience before satisfactory solutions will be found. •





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ONTARIO HYDRO

# News

APRIL, 1955





## NUCLEAR POWER AGE

ONTARIO Hydro's significant record in the fields of engineering and power development, over the past four decades or more, has been strikingly re-emphasized by the recent announcement that Atomic Energy of Canada Limited, Ontario Hydro and the Canadian General Electric Company Ltd. would participate in the design and construction of a nuclear power station.

For the past 15 months three Ontario Hydro engineers have been collaborating with engineers and scientists of Atomic Energy of Canada Limited in joint feasibility studies. These studies and subsequent preliminary designs for a small nuclear power plant undertaken by the group at Chalk River have culminated in the decision to build a nuclear power generating station with a capacity of 10,000 to 20,000 kilowatts.

Addressing a Toronto audience recently, Dr. Richard L. Hearn said the output of this station will be fed into the Commission's Southern Ontario System. The new plant will provide a practical means of studying nuclear station operation in conjunction with other types of generating stations, as well as facilities for continued research and design improvements, while at the same time supplementing the output of other generating sources.

Ontario Hydro must, in the foreseeable future, examine the question of using thermal sources of power to meet the province's electrical requirements. With a substantial share of Canada's uranium ore—the basic fuel for a nuclear reactor—available in Ontario, the Commission has, for the first time in many years, a natural resource to help operate its future thermal generating equipment.

While expressing the personal opinion that nuclear power stations will, in the future, "supplement our present resources, but not displace them," Dr. Hearn voiced his confidence in the fact that engineers and physicists will "find the road to development of nuclear power at costs competitive with other fuels."

As Dr. Hearn pointed out, Ontario Hydro and the thousands of people it serves stand on the threshold of the nuclear power age. It is gratifying to realize that the Commission, in seeking to provide for Ontario's future needs by its participation in this important new development, will have the opportunity of making another memorable contribution to Canada's technological progress.



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### COVER PHOTOS

Saluting the St. Lawrence Power Project (see "Spotlight on the St. Lawrence" on Page 2), this month's front cover shows the completed Hydro powerhouse access tunnels under the Cornwall Canal. Grading is in progress on the "backfill" for the north bank of the canal. This section of the canal was excavated to permit tunnel construction.

On the back cover is a recent winter view of the St. Lawrence Long Sault Rapids, a few miles west of Cornwall.

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## “FLOWER TOWN”

### Changeover

ONTARIO HYDRO changeover crews encountered many unique frequency-sensitive items during recent standardization operations at Brampton, near Toronto, which is known to many as the “Flower Town of Canada.” The largest of the town’s “flower factories,” aided by such electrical devices as light timers, produces more than 20,000,000 blooms a year, including approximately 10,000,000 roses. This grower — the large Dale Estate — has what is claimed to be the only electrically-operated rose-sorting “production line” in Canada. The device, shown above, consists of a series of hooks — suspended from a track — on which the roses are hung for rapid sorting and grading.



# SPOTLIGHT ON THE ST. LAWRENCE

**After an enforced delay of some 30 years, Ontario Hydro and its New York partner aren't losing a moment in harnessing the impressive hydro-electric resources of the St. Lawrence**

**A**LONG THE TURBULENT International Rapids section of the St. Lawrence River, rapidly-growing construction and engineering forces are bent upon the task of converting blueprints into power.

Today, less than a year since the final "green light" flashed on (June 7, 1954), with all the discussions and international negotiations recorded indelibly on mountains of newsprint, Ontario Hydro and the Power Authority of the State of New York are moving forward vigorously with this important project.

Together, these international partners are building the vast \$600,000,000 development. All costs of construction, maintenance, and operation of the project, except machinery and equipment in the respective powerhouses, will be borne equally by the two entities.

The official start of construction on the project was made August 10, 1954, at joint sod-turning ceremonies on both sides of the international border, just two months after the last remaining obstacle to development of power was removed on June 7.

In order to generate power from the International Rapids section of the river, it is necessary to utilize the present drop in water level between the eastern end of Lake Ontario and the powerhouse site near Cornwall. Because it is spread over a 125-mile stretch of the river, this drop (the mean is about 92 feet) is of little value for power purposes until it can be concentrated at one point. By effective use of control structures, a headpond will be created immediately above the powerhouse to produce an average operating head of 83 feet.

The Order of Approval for the power project by the International Joint Commission provides that the forebay water level will be operated at a maximum elevation of 238 feet

above sea level for 10 years or less. Experiments may be carried out during this period and if they prove it advisable, the forebay elevation may then be increased above the 238-foot level.

Harnessing the 35-mile stretch of the river for power purposes requires the building of a powerhouse and two dams, all of which is to be carried out without interruption to navigation in the present 14-foot canal. The powerhouse—the largest single structure of the project—will be bisected by the international boundary, and will span the channel between the eastern end of Barnhart Island and the Canadian shore, some two miles west of Cornwall. The structure, which in itself will

*(Continued on page 4)*

▷  
FIRST stage of building two tunnels under the Cornwall Canal to permit direct access to the Ontario Hydro powerhouse site involved round-the-clock excavation operations, using power shovels (foreground), and draglines shown at work on a higher level.







△ WITH excavation completed, workmen commenced the job of assembling and laying the large steelplate pipes which form the two tunnels. These passages have diameters of 10 feet (left) and 16 feet (right) respectively.

△ CONSTRUCTION of the tunnels necessitated temporary unwatering of a section of Cornwall Canal. Water was carried around the unwatered area by this flume to maintain a continuous water supply to Cornwall and district





POURING concrete in the larger of two powerhouse access tunnels under the Cornwall Canal which will be capable of carrying vehicular traffic. This tunnel and the parallel 10-foot tunnel are each 368 feet long.



IN BACKFILLING the section of the Cornwall Canal excavated for construction of the two tunnels, steel-sheet pilings were used to strengthen both banks of the canal and to prevent water seepage through the embankments.

act as a gravity dam, will have a maximum height of approximately 162 feet above the foundation and an overall length of 3,300 feet.

### 32 Units

Power will be produced by 32 generating units, 16 in each half of the plant. Described as a modified outdoor type in construction parlance, the powerhouse will have no conventional type superstructure over the generating room, but the units will be protected by removable housings. The architectural treatment will be simple and functional, with facilities being provided for a comprehensive view of the powerhouse area.

The average annual energy output of the generating station is ex-

pected to be about 12.6 billion kilowatthours.

Upstream from the generating station and stretching from the upper end of Barnhart Island to the United States mainland will be located the Long Sault Dam. The purpose of this structure will be to control the level of the water in the headpond allowing, as necessary, any excess amounts to bypass the international powerhouse. This dam and the power plant will combine to obtain the head of water required to operate the generators.

The Long Sault Dam will be a concrete gravity curved-axis spillway structure, approximately 2,250 feet long, with a maximum height of about 145 feet above the foundation. It will have a discharge capacity far in excess of the maximum

flow of the river. The spillway section will have thirty, 50-foot wide vertical lift gates. Because of low winter temperatures, special attention is being given to the problem of keeping the gates and guides free of ice by appropriate heating arrangements.

The third structure, a control dam, will be built 25 miles upstream from the Long Sault Dam in the vicinity of Iroquois Point on the Canadian side, and Point Rockway on the United States side. Its main function will be to permit regulation of the outflow of water from Lake Ontario. In addition to construction of these three structures, some 14 miles of dykes will be built, which will include almost 10 million cubic yards of compacted material. Channel improvements involving the





WITH this section of the Cornwall Canal restored to its original condition, well in advance of the navigation season, these cofferdams, which were used to unwater the excavation area, have been removed and the water returned to its normal course.

excavation of about 60 million cubic yards of earth and 5 million cubic yards of rock, will be carried out so that certain navigational and hydraulic requirements will be met.

To assist in the unwatering of the area in which the Long Sault Dam is to be built, advantage will be taken of the natural division of the river into two channels by Long Sault Island. The dam will be built in two sections and while the southern portion is being constructed, the water from the south channel will be diverted into the channel north of Long Sault Island in the immediate vicinity of the dam. While the northerly portion is being constructed, the total flow of the river will be diverted into the south channel and through the opening left in the southern portion of the dam previously constructed. These diver-

sions will be accomplished by means of diversion cuts through Long Sault Island and the construction of four cofferdams, the area within the respective cofferdams being pumped out to permit erection of the structures "in the dry." This arrangement will also allow construction operations to be carried out while maintaining satisfactory water levels in the various key locations.

#### Hydraulic Models

This process of construction was reached with the help of Hydro's hydraulic scale models located at A. W. Manby Service Centre in Islington, Ontario. These models accurately reproduce the International Rapids section and actual river conditions.

Built from data obtained in Hydro surveys, the models permitted

engineers to test methods of executing the power project before construction began.

An indication of the immense size of the power project is provided by the fact that about 2.7 million cubic yards of concrete will be required for all the structures on both sides of the river. This amount of concrete requires approximately 1.6 million tons of sand, and 3.3 million tons of coarse aggregate. In addition, 11,600 tons of structural steel and 21,500 tons of gates and cranes will be used. Excavations for the three structures will include 4,206,000 cubic yards of earth and 417,000 cubic yards of rock.

In July, 1954, first tenders were called by the two entities. These invited bids for cofferdam construction for the Long Sault Dam and unwatering a section of the river around the site of this dam, cofferdam construction for the powerhouse and unwatering of the area, and building of Ontario Hydro's project office west of Cornwall near the powerhouse site.

Construction of the Long Sault cofferdam is being handled by the Power Authority of the State of New York, while Ontario Hydro has let contracts for the other two jobs. The Cementation Co. of Canada received the contract for construction of the project office, while Mannix-Raymond of Montreal was awarded the contract for cofferdams in the powerhouse area. Prior to submitting their tenders, bidding companies were able to study Hydro's scale models in order to determine conditions existing in the river at the cofferdam sites, topography of the surrounding terrain, best means of access to the sites, and the velocities of the St. Lawrence waters with which the contractor would have to contend.

#### Powerhouse Cofferdams

Initial work was begun last year in the river's north channel on the two cofferdams to close off the area above and below the powerhouse site.

*(Continued on page 6)*



ARCHITECT'S perspective of the international St. Lawrence powerhouse to be located near Cornwall. The completed generating station will have a total of 32 generating units — 16 in each half of the large plant.

The first structure, a 500-foot long rock-and-earth fill barrier between Sheek and Barnhart Islands above the powerhouse site, was completed to the elevation required for winter operations. Its height is being raised this spring as needed. Some two-and-three-quarter miles downstream and immediately below the powerhouse site, work is now well advanced on the second and larger cofferdam. It will have a length of about 4,500 feet, stretching from the Canadian mainland to Barnhart Island in the United States.

At the northeastern end of Sheek Island, a channel which empties into the river between the locations of the two cofferdams, is spanned by the Mille Roches hydraulic plant of the St. Lawrence Power Company. The channel was closed when Hydro made arrangements for the cessation of the plant's operations. Power, formerly generated by this

plant for the company, is now being supplied from other sources.

When cofferdamming is finished early this year, the north channel of the river will be completely sealed off and the total flow will be carried by the south or main branch of the river between Barnhart Island and the United States mainland.

This year will see the enclosed area pumped out and excavation for the international powerhouse virtually completed. This immense task calls for the removal of some 3,535,000 cubic yards of earth and 320,000 cubic yards of rock. Hydro and its partner will share the work and by the end of the year it is estimated that a substantial portion of the rock will have been blasted out, and a start made on the structure incorporating the powerhouse.

On February 7 this year, the Commission announced that two Canadian firms had been awarded contracts for the manufacture and installation of 16 generators in the Canadian section of the St. Lawrence powerhouse. At the same time, Ontario Hydro awarded a contract for the production of crushed rock and manufactured sand to be

used as concrete aggregate in the building of Hydro's portion of the international powerhouse.

The generator contracts involve the purchase of 8 units from Canadian General Electric Company Limited, Toronto, and 8 units from Canadian Westinghouse Company Limited, Hamilton, at a total cost of approximately 13½ million dollars. Both firms have promised to meet the delivery date schedule which calls for the commencement of erection of the first unit on August 1, 1957. Subsequent units will be erected at intervals of one and-a-half to two months. A total of 10 companies in Canada, England and Europe submitted generator bids.

The contract for the production of crushed rock and manufactured sand from the Commission's quarry near Cornwall was awarded to C. A. Pitts General Contractor Limited, Toronto. A total of 16 bids was received from both United States and Canadian sources. The contract involves an anticipated 1,942,000 tons of rock and sand, at an approximate price of \$2,486,000.



A contract for 16 turbines and governors to be installed in the Canadian section of the St. Lawrence powerhouse has been awarded by the Commission to the English Electric Company of Canada, Toronto. The contract, for approximately \$7½ million, calls for deliveries to commence in March, 1956. It was one of seven bids received from Canadian and European companies. On March 11, this year, Ontario Hydro called for tenders for construction of the Canadian half of the powerhouse. Bids will be accepted until May 10, 1955.

In order to provide rapid and ready access to the unwatered powerhouse site for construction equipment, men and supplies, two tunnels have been constructed under the

Cornwall Canal. The tunnels, with diameters of 16 and 10 feet respectively, are located to give direct access to the powerhouse site.

The larger tunnel will be capable of carrying vehicular traffic, while the second will be used to move concrete aggregate from the storage area to a mixing plant, to be built south of the canal. To build the 368-foot long tunnels, the canal was closed off by two cofferdams and the enclosed section pumped dry. This section of the canal bed was excavated to permit installation of big steelplate pipes which form the tunnel. With the tunnels virtually completed, the excavation has been backfilled to restore the canal bed to its original condition and the cofferdams have been re-

moved. During construction of the two tunnels, a flume was installed, thus bypassing the cofferdammed area to carry water to Cornwall industries which normally obtain their supply from the canal.

In addition to tunnel work, a retractable Bailey bridge designed to handle heavy construction equipment and machinery spans the canal at Lock 19, 1½ miles west of Cornwall. Completion of these projects was scheduled ahead of the reopening of the 1955 navigation season so that St. Lawrence shipping would not be disrupted.

Activity will also move upstream, above the Village of Iroquois, to the Galop Rapids section of the river where work will commence on ex-

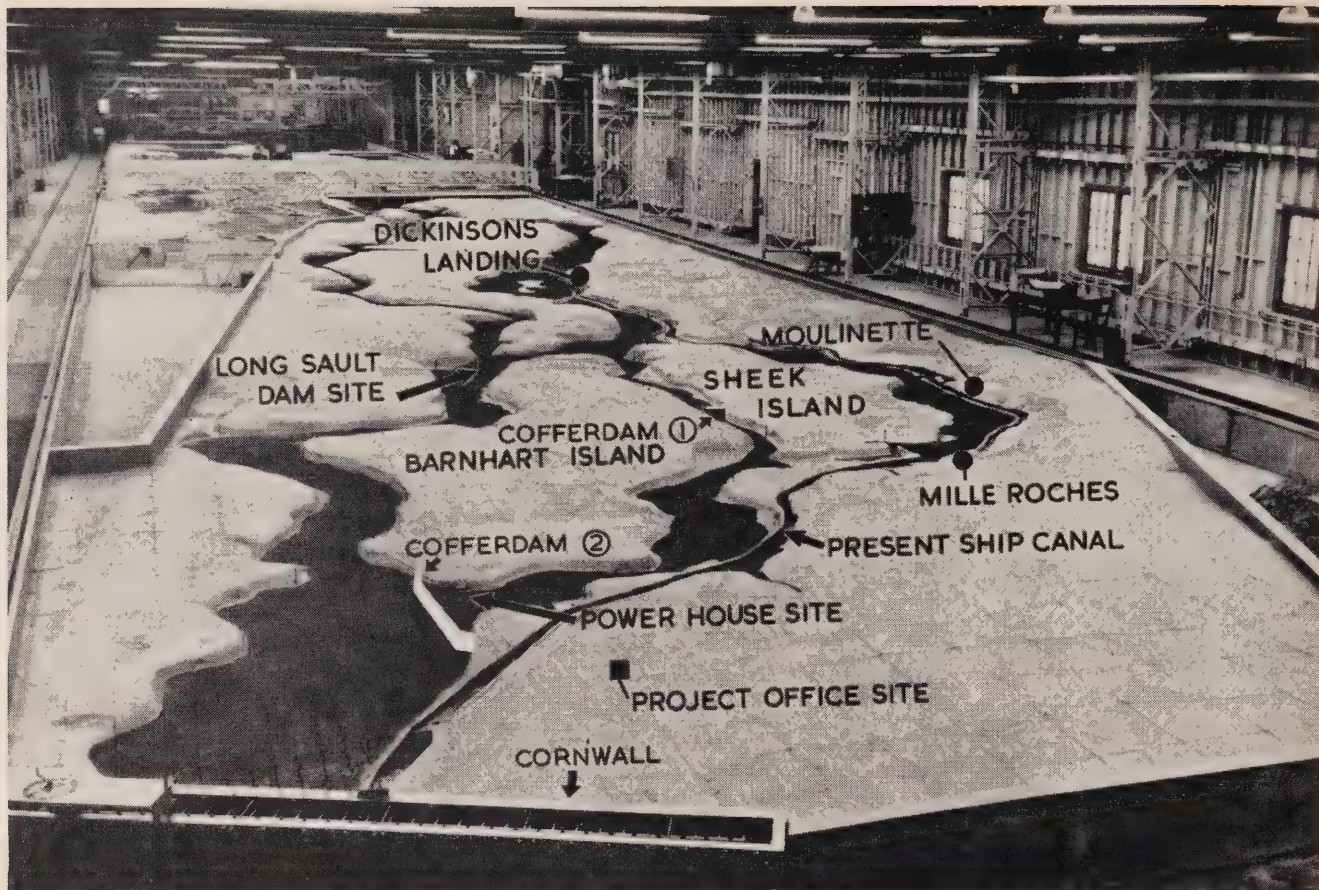
*(Continued on page 8)*



WORK in progress, above, on the 4,500-foot downstream cofferdam for the unwatering of the powerhouse site. The structure is being built in two sections: one section from the Barnhart Island (United States) shore, foreground, and the other from the Canadian mainland, background. The two sections will meet in the centre of the St. Lawrence River's north channel. Photo, left, gives another view of the cofferdam looking north to the Canadian shore.







△ SOME of the major construction features associated with the St. Lawrence Power Project are indicated on this marked photograph of the largest of three Ontario Hydro hydraulic scale models of the project work areas. Shown here are the locations of Dickinsons Landing, Moulinette and Mille Roches, three communities to be affected by the project. To the right of the international powerhouse site, 2 miles west of Cornwall, is the Commission's new project office. Present construction work includes the building of two cofferdams across the north river channel: (1) between Sheek and Bornhart Islands, above the powerhouse site, and (2) between Barnhart Island and Canadian mainland, two miles downstream. When completed, the enclosed area will be pumped out to permit excavation work "in the dry."

cavations for channel improvements. This work, necessary to obtain certain hydraulic and navigation conditions, will involve the removal of 29 million cubic yards of earth and  $4\frac{1}{2}$  million cubic yards of rock. Other similar channel improvements, though on a smaller scale, will be undertaken at Sparrowhawk Point and in the vicinity of Point Three Points and Ogden Island.

A major portion of this year's work program on the power phase will revolve around the building of dykes on the Canadian shore. During the next three years, about three miles of dyking will be completed in the area extending north and

west of the Canadian section of the powerhouse. Its function will be to contain the headpond or water storage area which will be created by the Long Sault Dam and the international powerhouse. These dykes will have a top elevation of 254.5 feet above sea level. They will be trapezoidal in shape (flat across the top with sloping sides), and their construction will require some 5,571,000 cubic yards of earth. About 359,000 cubic yards of stone, known as rip rap, will be placed along the sloping sides.

Although initial power from the St. Lawrence is not scheduled for delivery until the summer of 1958,

rearrangement this year of certain transmission lines is necessary to tie-in with construction plans for both the power project and the seaway. The power lines, associated with Hydro's Niagara-Mohawk power interchange and the Cedar Rapids circuit, are to be dismantled and replaced by lines which will bypass Barnhart Island. This job will be completed later this year. The lines presently stretch from the United States mainland across Barnhart Island to Hydro's Cornwall Transformer Station near the powerhouse site.

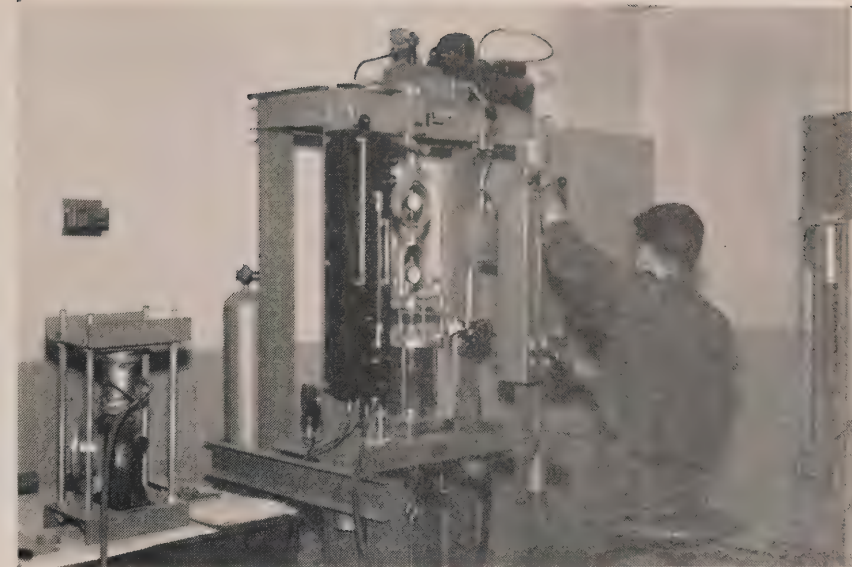
In May, construction will get un-



derway on the St. Lawrence Transformer Station, to be located about 1½ miles north of the international powerhouse. The station, which will also eventually contain switchyard facilities for the Canadian section of the development, will be ready for operation in 1956. It will replace Hydro's Cornwall T.S. which must be dismantled owing to flooding in the area.

Other phases of construction scheduled for 1955, and to be handled by the Power Authority of the State of New York, include the Long Sault Dam and the Iroquois Dam. In both cases, rock and earth excavations will be well underway before the end of the year, with the prospect of some concreting being started.

Power from the St. Lawrence will be the culmination of Hydro's history-making construction program which was begun in 1945 and has involved 16 new power sources—14



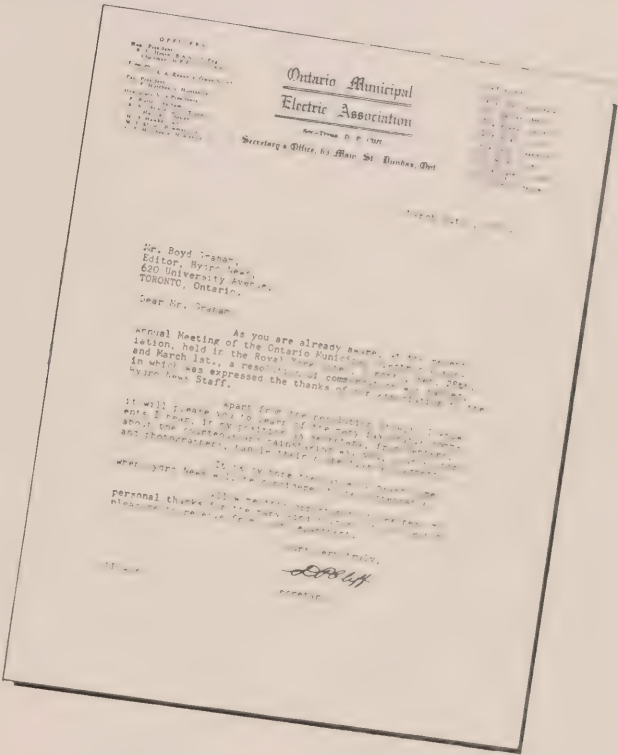
EXAMINING soil conditions in the vicinity of the large power development by means of a triaxial soil tester in Hydro's St. Lawrence Power Project soil and geology laboratory.

of which are now in full or partial service. This record of achievement has extended across the province and by the end of 1954 had in-

creased the Commission's dependable peak capacity to 5,543,000 horsepower—a jump of 113 percent over the 1945 figure. ■

# O.M.E.A. APPRECIATION

IN OFFICIALLY conveying advice of the resolution passed by members of the O.M.E.A. at the recent convention expressing appreciation to the Editor and staff of Ontario Hydro News (March, 1955), Secretary-Treasurer D. P. Cliff has added his personal thanks. His letter is reproduced herewith.



MEMBERS of 1955 District 5 executive. Seated from left: W. B. Elliott, St. Catharines; Thomas Barnes, Niagara Falls, President; C. R. Buss, Thorold. Standing, from left: Roy Pierson, Brantford Township; Cecil Swayze, Welland; J. A. Williamson, Niagara Falls; Frank Kaupp, Merriton, and Harold Schneider, Port Dover.



# DOUBLE LOADS

**M**UNICIPAL ELECTRIC loads are likely to double in the next 10 years and "it is, therefore, not only essential, but urgent, that municipal utilities make certain that their planning for the future is adequate," I. K. Sitzer, Hydro's Director of Consumer Service, informed delegates at the annual meeting of District 5 O.M.E.A.

As the main speaker at the well-attended gathering in the southern Ontario tobacco centre of Delhi, Mr. Sitzer said that the doubling of present loads would involve a multitude of distribution problems. "The total plant value of the municipal utilities' distribution systems in the past 10 years has increased by about \$100 million, and based on probable costs and load trends, the amount of money required for this purpose in the next 10 years will be probably more than double this figure."

Because of this anticipated load growth, utilities will have to give consideration to the installation of heavier and duplicate lines and the need for additional stations to serve the distribution systems of the future, he said.

"Sites for substations are becoming increasingly difficult to obtain," he warned, "and the more built-up areas of greatest load growth should receive the closest scrutiny as to the most desirable locations for such stations. I think we must anticipate that utilities will be under increasing pressure to improve the appearance of their distribution systems, and types of construction and equipment to reach this objective must be devised."

Mr. Sitzer also indicated that such enlarged distribution systems will require additional staff to construct, operate and maintain them.

The selection and training of adequate staff must also be kept in mind at all times, he said.

## Municipal Load Growth

The Director of Consumer Service foresaw an increase in municipal load growths resulting from, among other factors, continued industrial development in Ontario. Such expansion, he said, was supported by extensive economic studies which reveal that:

—The favorable conditions influencing new industries in the determination of their location are found in Ontario. An abundant supply of low-cost power is a major consideration in this respect.

—The rate of development of Canada's natural resources is being increased to supply both this country's industrial requirements as well as to supplement the rapidly dimin-





POPULAR feature of the one-day convention at Delhi was a panel discussion on customer deposits and service calls. Panelists were, left to right W. D. Stalker, Simcoe; Ray Pfaff, St. Catharines. Lt. Col. A. A. Kennedy, O.M.E.A. President, who acted as panel moderator; Roy Pierson, Brantford Township, and Frank Kaupp, Merriton.

FOUR delegates, left to right: Cecil Swayze A. W. Pratt, and James A. Hamilton, all of Welland, and W. E. Stetler, Delhi, examine samples during tour of a tobacco-processing plant.



## MUNICIPAL HYDRO SYSTEMS MUST PREPARE FOR FURTHER EXPANSION, DIRECTOR OF CONSUMER SERVICE TELLS O.M.E.A. DELEGATES

ishing resources of the United States. Such activity inevitably calls for large amounts of electricity.

—An anticipated population increase of 20 percent by 1963 will mean a larger labor force and consequent expansion of the manufacturing industry. This prospective rise in population must be reflected in greater use of electrical energy.

"Thus, I feel that the trend of industrial development in the past should be maintained in the next decade," Mr. Sitzer said. "The rate of expansion may, of course, fluctuate from time to time, but, over a 10-year period, it is not prudent to depart from the assumption that the past trend of industrial expansion will continue."

Turning to the question of future domestic and commercial loads he expressed similar optimism.

"These customers," he said, "in an expanding economy, will anticipate and demand the newest and best in electrical utilization equipment, and despite the availability of natural gas or other forms of energy, will continue to consider electrical energy as a prime requisite in their high standard of living. Commercial loads have always been in the front ranks in utilizing electrical energy to service and sell their products, and continuance of the past rate of growth of commercial loads must be anticipated."

Noting that municipal utilities now purchase some 52 percent of the Commission's total energy load, Mr. Sitzer said that from 1943 to 1953 their primary power requirements increased at a rate equal to about 9 percent per annum.

With the expectation that muni-

cipal loads will be greater in the future. Mr. Sitzer indicated that new rate structures would undoubtedly be required to provide a proper assessment of costs to customers.

"The A.M.E.U. Rates Committee, in co-operation with the Commission's Rate Study Engineer, has already made a start in this field," he declared.

Mr. Sitzer assured his listeners that the Commission stands ready to assist municipal utilities, through Hydro's Regional Offices, on any special problems that may arise in the planning of future distribution systems. "There is every indication that municipal utilities, in the decade ahead, will have heavy responsibilities, many problems, but never a dull moment," he concluded.

After Mr. Sitzer's well-received

*(Continued on page 12)*

address, the convention turned to an increasingly popular feature, the panel discussion. With Lt. Col. A. A. Kennedy, President of the O.M.E.A., as moderator, a team of four—W. Douglas Stalker, Simcoe P.U.C. Manager and Secretary; Ray Pfaff, St. Catharines P.U.C. General Manager; Frank R. Kaupp, Merritton Hydro-Electric Commissioner, and Roy Pierson, Chairman, Brantford Township Hydro-Electric Commission—gave their opinions on “Consumers’ Deposits and Servicing Costs.”

On the question of deposits, each of the four municipalities represented revealed that the method of handling such deposits reflected a desire to meet circumstances peculiar to its community. Most agreed, however, that deposits are too small nowadays, that they have remained constant over the years, while electrical consumption and consequently the amounts billed, have risen.

When it was suggested that customers’ deposits should be higher and more uniform throughout the province—“customers complain about the difference when they move to a new municipality”—Frank Kaupp disagreed. “There are areas,” he said, “where gas is a major consideration, and by charging higher deposits we are running the risk of losing customers.”

Interest on deposits is paid in some municipalities while others simply keep the money in a special account and refund it when the customer moves away. On the overall problem, however, it was the general consensus of opinion that no standard of deposits could be established.

Servicing costs presented a somewhat similar situation, with each municipality having a different approach. For example:

—Simcoe suggests an electrician be obtained if only some of a customer’s lights are out; if all lights are out, a serviceman attends to it at no charge. If there are further difficulties, the customer is requested to summon an electrician.

—St. Catharines will send a serviceman out night or day with a standard \$2.00 service charge for weekday calls and \$3.00 for weekend calls.

—Brantford Township believes in charging for certain services.

—Merritton answers all trouble calls. If the trouble is beyond the main switch, the customer is billed.

### Inspect Tobacco Plant

Nearly 100 delegates attended the one-day annual meeting which began in the morning with a tour of the Imperial Tobacco Company’s plant in Delhi. There, the visitors had an opportunity to see modern methods of processing tobacco.

The business session was held in the afternoon. Delegates observed a one-minute silence in memory of the late Hydro Chairman Robert H. Saunders. In a tribute to Mr. Saunders, D. P. Cliff, O.M.E.A. Secretary-Treasurer, said Hydro had suffered an irreparable loss through his death.

“Democracy has a way of bringing forward individuals at critical times,” Mr. Cliff said. “That was true of Mr. Saunders. When Hydro was confronted with a power shortage, Robert Saunders came to the Commission with his dynamic power. He seemed to reorganize the whole system. A different spirit became evident in no time at all. Hydro is more of a fraternity, more of an institution, because of Robert H. Saunders.”

The meeting then passed resolutions congratulating Dr. Richard L. Hearn upon his appointment to the Chairmanship, Dr. Otto Holden as Chief Engineer and A. W. Manby as General Manager.

Officers elected for the coming year were: Thomas Barnes, Niagara Falls, President; William B. Elliott, St. Catharines, First Vice-President; C. R. Buss, Thorold, Second Vice-President. Directors—Roy Pierson, Brantford Township; Frank R. Kaupp, Merritton; Cecil Swayze, Welland, and H. J. Schneider, Port

Dover. J. A. Williamson of Niagara Falls was again returned as Secretary-Treasurer.

The one-day session concluded in the evening with dinner at which Magistrate R. G. Groom of Tillsonburg was guest speaker. He delivered an amusing and highly informative address on “The Power of Words.”

—by A. A. Bolté.

## District 8 O.M.E.A.

Speaking at the annual meeting of District 8, O.M.E.A., at Chatham, W. Ross Strike, Q.C., Ontario Hydro’s Second Vice-Chairman, said that the power phase of the St. Lawrence Development is proceeding on schedule.

“Ontario’s power supply can be predicted until 1960,” said Mr. Strike, “but there’s no indication that the power demand will lessen in the next five to ten years. Nearly half the fresh water of the world is located along the borders of Ontario,” he added, “and with the completion of the St. Lawrence Seaway, the Great Lakes basin will be the industrial centre of the world.”

Referring to the great postwar expansion which has put Hydro in the position where “we now have some reserve and have time to catch our breath,” Mr. Strike said that the respite would provide time for Ontario Hydro to consolidate its organization—“get it perfect.” He felt that the same task lay ahead of the municipal commissions throughout the province.

Mr. Strike recalled that he had served in the Hydro organization under three chairmen. He described the appointment of Chairman Richard L. Hearn as “a splendid appointment, one that assures Hydro of the continuing service of a man of invaluable experience.”

In a tribute to the late Hydro Chairman, Robert H. Saunders, Mr. Strike said that Hydro had lost a great leader and a great friend. He



described the late Chairman as a man who took on far too much because of his high sense of public duty. "He led a sacrificial life," said the speaker, "and died a sacrificial death."

During the business session fol-

lowing the election of officers, a resolution was submitted by William Anderson, Windsor, calling for the establishment of a provincial authority to bring about a uniform system for the licensing of electricians in Ontario. Present licensing is, in ef-

fect, on a local basis, without any uniformity as to the qualifications required. After considerable debate, in which it became apparent that the proposed provincial authority would result in the abolition of possible duplication of licence fees on the local level, and thus save money for the individual electrician, the meeting voted to send the resolution on to the Resolutions Committee of the O.M.E.A., with the request that the matter be taken up at the annual meeting in Toronto.

Election of the 1955 Executive of District 8 saw Stanley G. Thomson, Chatham, returned as President. W. P. Bolton, Windsor, was returned as First Vice-President, and Gordon Fuller, Windsor, was elected Second Vice-President. Directors elected were: Thomas A. Cada, St. Clair Beach; F. J. Maher, Sarnia, and Ray Warwick, Blenheim, while R. S. Reynolds, Chatham, was re-appointed as Secretary-Treasurer.

*by J. G. Murphy.*



△

THIS group, seated left to right: Gordon H. Fuller, Windsor; Stanley G. Thomson, Chatham, President; W. P. Bolton, Windsor; standing, left to right: F. J. Maher, Sarnia; Thomas A. Cada, St. Clair Beach, and Ray Warwick, Blenheim, includes the 1955 District 8 officers.



△

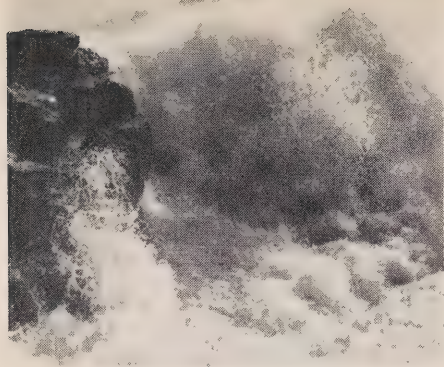
KINGSVILLE quartette, left to right: Burns Hutchinson, Gary Hogarth, Elmer Sherman, and John Sanger finds a pleasant topic while discussing program for District 8 annual meeting.

## Classified Ads

### FOR SALE

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100 phase P Control circuit  
25 cycle 110 volts. Style No.  
72350B Serial No. 280416
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2000 phase P Control circuit  
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Interested parties may obtain prices, etc., by directing their inquiries to Stratford P.U.C., Stratford, Ontario, attention: Mr. E. A. Washburn, General Manager.



# PATHWAYS TO POWER

## Chapter II

### POWER PLANNING

by M. H. MACKENZIE, B.A.Sc., Director of Planning

**P**OWER PLANNING has been defined as the preparation of a program for the development of a power system, so that it can evolve in an orderly and economic manner. It is not concerned with routine, day-by-day problems of operation, or of design, except to the extent that these problems affect future system development. Briefly, power planning is the process of determining *when* new facilities should be provided, *what* form they should take, and *where* they should be located in order to ensure adequate electrical service at *minimum cost*.

The foundation of power planning consists of an estimate of future load demands, and a complete knowledge of existing and available sources of power. The need for new power sources is governed by the demand of the whole system. The need for new step-down transformer stations is governed by area demands, while the need for new distributing sta-

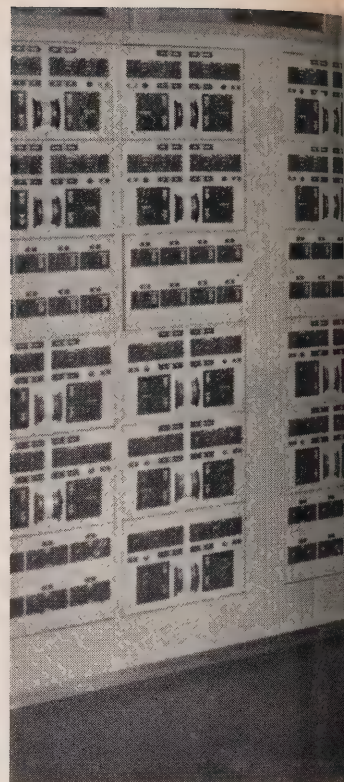
tions is governed by the demands of still smaller areas. Thus, power planning requires a forecast of future load in considerable detail so that small, individual components can be integrated into area demands, and these into system demands.

The system demand for power varies with the seasons of the year and upon the geographical location. In Ontario the winter months with their low temperatures and short days give rise to both maximum peak and energy demands. *Figure 1* (on page 16) illustrates this point

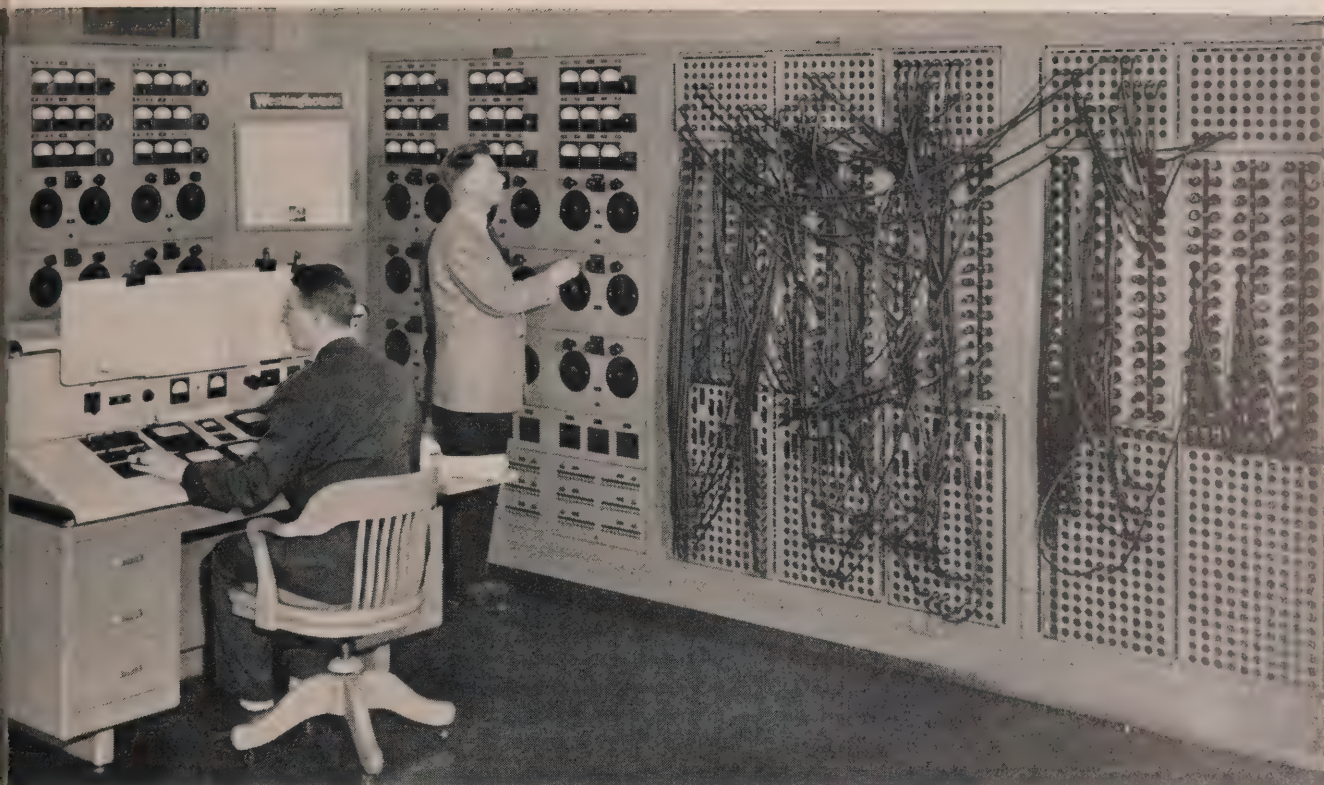


and consideration of the curve for December makes further definition of "peak load" unnecessary. The peak load expressed in kilowatts or horsepower governs the total power rating of the generators which must be available. The area under the load curve represents the energy (kilowatthours) which must be generated and governs the amount of water, or of fuel, which must be used in the generating stations.

The power and energy generated in hydraulic plants also varies with the seasons of the year. In spring, the melting snows provide large volumes of water and the rivers are in flood. At this time, due to high water, the plants lose some of their ability to supply peak, but can produce large amounts of energy. It is during the spring freshet that the reservoirs are replenished so that water can be made available for use in the plants during the dry summer and early autumn.







△ GENERAL view of Network Analyzer, which, on a miniature scale, can duplicate any portion of the Commission's province-wide electrical system. Hydro engineers Paul Dandeno, seated, and Fred Iley are "previewing" conditions likely to be experienced in a given set of circumstances.

It should be noted that maximum availability of water does not, in general, coincide with maximum demand for power and energy. Throughout the year both load and capability of hydraulic plants are continuously changing. Therefore, the most accurate possible knowledge is required in power planning.

#### Load and Capacity Forecasting

Estimates of future load are the responsibility of a committee known as the "Advisory Committee on Load and Capacity," comprising senior engineers of various divisions of the Commission, including a representative from the System Planning Department. At meetings of this committee, estimates submitted in detail by the Regional Offices for their respective territories are reviewed, modified where necessary, and combined to provide a load estimate for the overall system. Thus, peak power and energy requirements

are estimated for each month of an ensuing two-year period, and for period of five years.

The committee, at the same time, estimates the capability of existing generating stations to supply the load. This involves study of water storage conditions and natural drainage from the various watersheds. Allowances are made for removal from service of any generator for routine maintenance or other purposes.

The estimates of load are then compared, month by month, with existing resources, taking into account suitable reserves of generation (in excess of the load) which should be available to take care of emergencies. The results are incorporated in tables and charts which indicate the estimated peak and energy surplus or deficit in the future period under consideration. These are then submitted to the executive

officers of the Commission and, after being approved by them, become the official basis for further study.

Because of the importance of having load estimates as accurate as possible they are constantly under review. By careful analysis it is possible to detect changes in trend so that, in normal times, the short-term load forecast can be made with a fair degree of accuracy. *Figure 2* (on page 16) illustrates the growth of peak demand of a typical power system for 31 years, and shows that the long-term growth approximates 5.7 percent per year.

If the demand of a system is 3,000,000 kilowatts, an error of two percent in load estimate represents 60,000 kilowatts. To provide this amount of power in a new hydraulic plant would cost in the order of \$15,000,000 for the plant alone.

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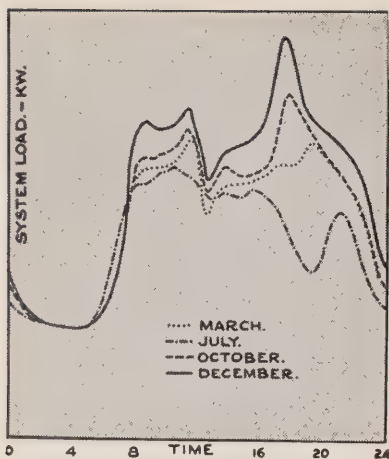


FIGURE 1—TYPICAL daily load curves, showing how the load demand varies over a 24-hour period for each of the four seasons.

FIGURE 2—Graph shows the growth of peak demand of a typical power system over a period of 31 years. Long-term growth is shown to approximate 5.7 percent per year.

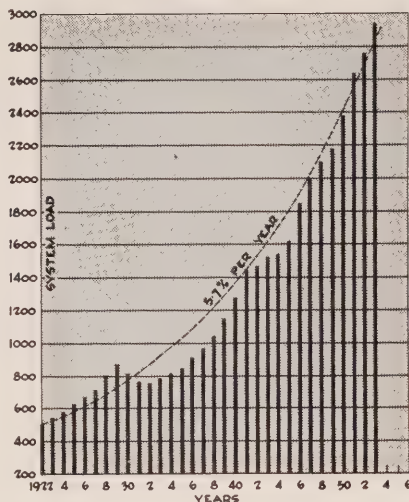
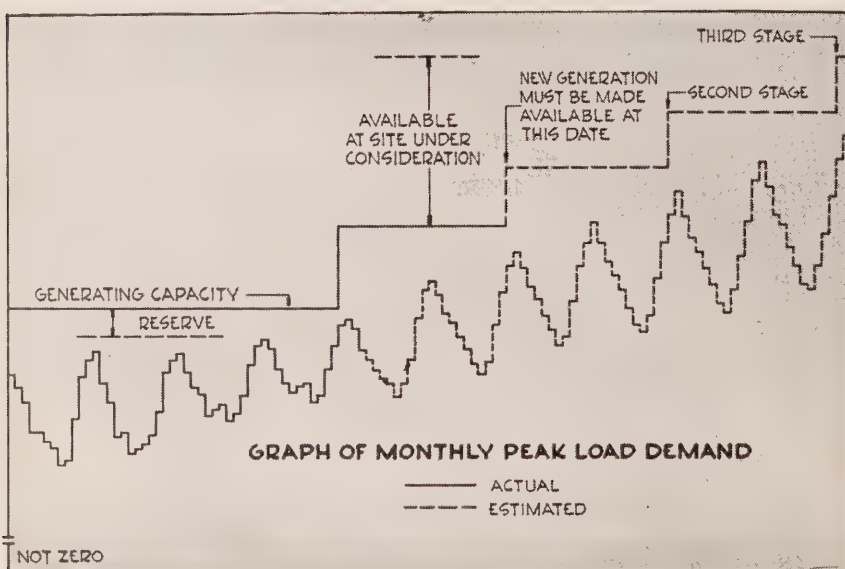


FIGURE 3—Chart illustrates estimated monthly peak load demand, and indicates when additional power is required in order to supply the load, and maintain an adequate system reserve. The graph of generating capacity is for the construction of one particular site which, in this instance, is scheduled for development in three stages.



Transmission line and terminal facilities could require a further expenditure of some \$3,000,000, making a total of approximately \$18,000,000. Thus, if these facilities are added to one system before they are required, it means that \$18,000,000 of capital must be raised and unnecessary carrying charges amounting to about \$1,250,000 per year will have to be met out of revenue. This example emphasizes the necessity of accurate load forecasts and also points to the fact that long-term trends are only satisfactory for general planning. Before a new plant costing millions of dollars is undertaken the immediate future power requirements are studied in great detail.

### Need for New Plants

From the load estimates the necessity for constructing new generating plants is determined. The chart shown in *Figure 3* (on this page) indicates the amount of new generation required and when it must be made available for use. This chart, however, considers only the requirements of the generating plants to supply peak power. In a similar manner the need for new power plants to supply the energy (kilowatthour) demand is considered. This is far more difficult since it involves a complete knowledge of the amount of water available at all existing hydraulic plants and that which could be made available at the new plants. It is necessary to co-ordinate the operation of all existing plants so that best use is made of the water. Having done this, the requirements of new plants from both peak and energy standpoints are established. It is then necessary to decide whether any of the available hydraulic sites can, of themselves, meet the needs of the system, or whether the new power plant should be a fuel-electric plant, or whether a combination of fuel and hydraulic plants should be made.

An important factor in this decision is the consideration of what could happen if a "dry" year were experienced. In this event the en-



ergy output of hydraulic plants is materially reduced. On the other hand, the capability of fuel-electric plants is independent of weather conditions as the energy output is directly governed by the amount of fuel fed to the furnaces.

In general, a decision to construct a new plant is not made without consideration having been given to the following points:

- (1) The amount of peak power and of energy required.
- (2) The capability of alternative hydraulic sites to supply these needs with normal water supplies and what would happen should a dry year occur.
- (3) The cost of alternative hydraulic developments and of fuel-electric plants.
- (4) The cost of fuel for fuel-electric plants.
- (5) The new transmission facilities required to incorporate the plant — hydro-electric or fuel-electric — into the system.
- (6) The requirements of reserve power on the system to meet contingencies.

In the final analysis, every addition to the system is made with the object of meeting the anticipated load demand with optimum use of water or fuel, so as to provide a system which will be acceptable from operating and security of supply viewpoints, and to accomplish this with the minimum expenditure.

### Selection of New Plant

Having established the need for a new plant which, by the way, must be determined in advance of its actual requirement by the time required to design and to construct the plant — representing a period of between three and five years, depending on the type and size of plant required — it is quite possible that several alternatives must be considered.

Hydraulic sites are fixed in their location by nature, and it is axio-

matic that as a system grows the most economic developments are selected progressively. Thus, as time goes on, the available sites become more and more remote from the load centres and, therefore, require long transmission lines to deliver

their output to the centre of load. On the other hand, fuel-electric plants can be located at will, provided ample cooling water is available and the cost of delivering fuel is not excessive. Thus, as time goes on, the relative economy of hydraulic versus fuel-electric

generation becomes more and more critical.

The investigation of alternative sites and type of new plants used to be a formidable task. Nowadays, planning engineers use the Network Analyzer, which reduces the time and effort required enormously. In fact, without the use of this modern device many investigations, now considered routine, would not be undertaken because the amount of work and time required to arrive at quantitative conclusions would be prohibitive.

The Network Analyzer permits a miniature replica of the system to be set up which represents, to scale, the electrical characteristics of all generators, transformer banks, voltage regulators, transmission lines and loads. The loading of transmission lines and of the various units of equipment, together with voltage conditions at all points on the system, can be determined and recorded. By this means, the effect of alternative additions of generators and transmission lines can be tried out in a short time with the confidence that, if the system is constructed with the characteristics used on the calculator, then the operating results will correspond.

The system is first studied with existing facilities, and for estimated loads corresponding to the year just before the new power is brought in. These conditions are then noted.



The next step is to increase the area loads in accordance with the official estimate to a value which will absorb all the power available in the proposed plant under investigation.

The new power source is then added to the system and a study of the power flows indicates the area with greatest deficiency of power to which the new power source should be most directly connected. In this way, the necessary transmission lines to connect the new power site, and to reinforce the system internally for the heavier loads are also indicated.

In this way, too, alternative power sites are studied for widely-differing conditions of load, as for example, estimated loads for various hours of the day of different months of the year, such as July and December. Further studies indicate the values of short circuit current and the effect of these short circuits on the system. This information has a bearing on the transmission line requirements and the specification of the switching equipment.

### Specification of Equipment

Analysis of the results obtained from the Network Analyzer permits a selection of the best method of providing for future load demands. Having made the selection, the various electrical characteristics of the new facilities to be provided are determined.



Thus, the reactance of the generators and step-up transformers at the generating station, the inertia of the generators and reactance of the step-down transformers at the receiving stations is stipulated. These factors have a direct bearing on the stability of the system. In other words, they govern how the system will "hold together" and continue to deliver power during storms when

*(Continued on page 18)*

lightning strokes cause line outages. The "required turns" ratio of the transformers is decided upon and the equipment necessary to provide adequate voltage control is determined.

### Decision to Construct

Thus far the planning engineers have determined the need for a new generating station and have assessed the various alternatives. At this stage the specifications are sent to the Engineering Division for estimates on the cost of construction. An economic comparison of the respective schemes is prepared and a comprehensive report is completed for management consideration. This report includes a recommendation to embark upon a specific program of construction.

Upon receiving approval of the recommended scheme a formal request to proceed with the work is made. Receipt of Commission approval is the signal for preparation of work orders and commencement of detailed design leading to construction of the project.

### Transformer and Distributing Stations

The foregoing has dealt specifically, although in a superficial manner, with the planning of new power resources. This is only one aspect of power planning for it is the customers who give rise to the need for more power. Having provided power in bulk at the generating stations, it must be delivered to each and every customer in an acceptable manner which includes suitable voltage and continuity of service.

Once again estimates of future load form the foundation for the planning procedures. As mentioned previously, the regional load estimates are submitted in considerable detail so that it is possible to integrate and group them in any desired manner.

The supply to large municipalities and surrounding areas is usually from transformer stations which step the power down from 115,000

volts to either 28,400 volts or 14,200 volts. These stations are relatively large — handling up to 120,000 kilowatts — and before the power is delivered to the ultimate customer, further voltage transformations are necessary. The next transformation is from 28,400 or 14,200 volts to either 12,500, 8,300, 4,600 or 2,400 volts. The higher voltages are normally used to supply rural customers, while the lower voltages are used for small municipalities and concentrations of load. The stations which accomplish this are known as distributing stations and generally range in size from 1,000 to 6,000 kilowatts.

Continuing records of the loads carried by existing transformer and distributing stations are maintained and projected into the future. From these forecasts of future loads, the necessity for providing increased transformer capacity is determined. In this regard it is usual to have at least two choices. Either an existing station might be enlarged or a new station constructed.

When considering these alternatives, a very close liaison is maintained between the Planning Division and the municipality in question. The prime objective is to obtain the maximum benefit from the minimum overall expenditure. Therefore, the expense to both the Commission and the municipality is considered.

In a similar manner to that described for new generating stations, alternative plans are developed and cost estimates requested. After a complete economic analysis, a report is made in the case of the larger projects and submitted for approval of the recommended scheme.

### Program Planning and Control

Any plan to provide new or extended facilities involves the determination of when the facility should be made available, and the program to be followed to achieve this result.



In many cases the desirable in-service date, from the standpoint of system requirements, is not specific, but may vary within a considerable time period, and so may be adjusted to best suit the engineering and construction work load, availability of equipment, and co-ordination with other projects. Further, due to changing conditions, these and other factors which must be considered in establishing the in-service date and the program or schedule to be followed, require constant review to ensure that the in-service

dates are always realistic, in the sense that they can be met and that it is economical to do so.

As soon as a need or a change in a facility is recognized, whether it be a new generating station, a new high-voltage circuit on an existing tower line, or an additional power transformer at a low voltage distributing station, this information of the proposed project is included as part of the Capital Construction program. As studies develop and the requirements become firm, the proposed project becomes correspondingly a more definite item in the overall program.

A time schedule for the project through the planning, estimating, approval, engineering, design, and construction stages is developed to meet the desired completion or in-service date. The progress of the project is then plotted through all its successive stages in order to have the schedule requirements met. Since individual projects may be associated as part of an overall scheme, the completion of which requires engineering and construction work by a number of departments, the performance of this function also requires that all activity be adequately co-ordinated to obtain completion of the individual projects at the times required to suit the overall plan. Developing from these

*(Continued on page 24)*



# HORNEPAYNE "ON THE LINE"



THIS group, left to right: Mrs. W. H. Woodhouse, wife of Wicksteed Township's Reeve; N. A. Walford, Manager, Central Region, C.N.R., and Mrs. Walford; H. R. Graham, Manager, Hydro's Northeastern Region, who welcomed village; R. H. Menary, Secretary, Hornepayne Chamber of Commerce, and W. H. Murray, C.N.R. Superintendent, Hornepayne, participated in the "Hydro Day" ceremonies.



WORKING in temperatures down to 50 degrees below zero, members of a Hydro line construction crew, including, left to right, Bill Hanson, Lloyd Winters, and John Joy, are shown rigging a transformer during construction of a new distribution line to serve Hornepayne customers. The community, which has approximately 335 customers at present, will receive Hydro service through Kapuskasing R.O.A.

COMMUNITY - WIDE "Hydro Day" celebrations were held in Hornepayne recently to mark the supply of electricity by Ontario Hydro to the northern village, a railroad divisional point some 300 miles east of the Lakehead.

Residents were officially welcomed into the growing family of Hydro customers by H. R. Graham, Manager of Hydro's Northeastern Region, who was guest speaker for the occasion.

"Hydro Day" celebrations included the showing of a Hydro film — "Niagara The Powerful" — to school children in the Hornepayne Continuation School. Official ceremonies took place in the evening with a dinner, followed by a public meeting in the local Y.M.C.A. Auditorium attended by more than 200 persons at which Mr. Graham cut a ribbon to symbolize Hornepayne's new electrical status. A dance, sponsored by the Hornepayne Council, concluded the festivities. Roy Menary, Secretary of the Hornepayne Chamber of Commerce, acted as Master of Ceremonies.

In his address, Mr. Graham ex-

plained that Hornepayne had become part of Hydro's Northern Ontario Properties which is operated by the Commission on behalf of the province and financially is completely separate from Hydro's Southern Ontario System.

On February 1, Hydro took over the distribution of power in the community which was formerly supplied with electricity by the Canadian National Railways. In order to serve the village, the Commission installed two diesel units in the C.N.R. roundhouse and rehabilitated the local distribution system. Another generator will be installed later this year, and the railway has agreed to keep one of its diesel generating units available for standby purposes.

The village, founded in 1916 when the Canadian Great Northern Railway was built through the district, has received its power from the C.N.R. and its predecessors for the past 35 years. Ontario Hydro was requested to take over the supply by local officials and civic leaders when the village's electrical requirements reached the point

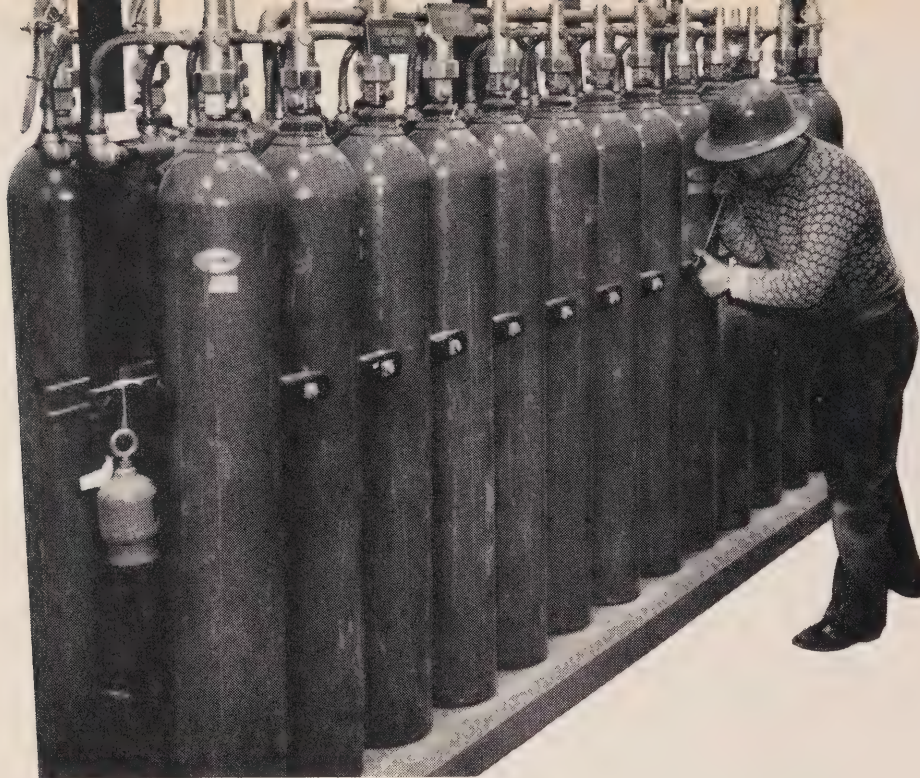
where they would soon have exceeded the capacity of the C.N.R. generating facilities.

Some 300 domestic, 35 commercial and one power customer are being served by Hydro in Hornepayne. An additional 27 domestic customers have requested service. All customers will be served by Ontario Hydro through the Kapuskasing Rural Operating Area Office.

Kapuskasing R.O.A., under the managership of Arthur Draves, is one of the nine such areas comprising Hydro's Northeastern Region whose boundaries extend from Sundridge to James Bay and from Mattawa to the west boundary of the Algoma district. This region, one of nine into which Ontario is divided for purposes of Hydro administration, operates and maintains 19 hydro-electric generating stations, a compressed air plant, and 3,440 circuit miles of transmission lines.

At the end of 1954, Hydro was serving 28,103 customers in 12 contract municipalities, 23,070 customers in 18 local systems and 29,653 customers in rural districts of the Northeastern Region. ■





BANK of carbon-dioxide cylinders being installed for fire protection system at the Sir Adam Beck-Niagara Generating Station No. 2.

## INSTALL AND TEST NEW PROTECTION SYSTEM AT PINE PORTAGE GENERATING STATION

# SILENT FIREMEN

By A. A. Bolté

**T**HE SHRILL whine of a siren pierced the interior of the 285-foot long powerhouse of Hydro's Pine Portage Generating Station.

Simultaneously, a red bull's-eye light flicked on and off in the ultra-modern control room. Technicians and engineers checked the delicate mechanisms in the Commission's most northerly power plant on the Nipigon River and smiled. The test was a success.

Thus, this up-to-date method of providing the maximum protection for generating units from the unpredictable hazard of fire was given its first practical application at Pine Portage. An automatic system, which detects even the slightest short circuit in any of the units, this new equipment incorporates the latest improvements and most dependable features of present-day fire protection.

Its operation is based on the fire-extinguishing properties of carbon-dioxide — CO-2. This agent is forced into the generator under pressure until a 25-percent concentration is reached, thereby reducing the percentage content of the oxygen to the point where it will not support combustion, thus smothering the fire.

The gas has additional qualities which make it more desirable than water for combating fires which might break out in a generator. For example, a CO-2 system operates automatically, whereas a water system must, of necessity, be manually-operated. Therefore, in the case of fire, where time is a vitally important factor, the use of water is regarded as a much slower method. Moreover, once water has been introduced, the unit cannot be restored to service until repairs are made and the machine completely

dried out, with a consequent loss of power.

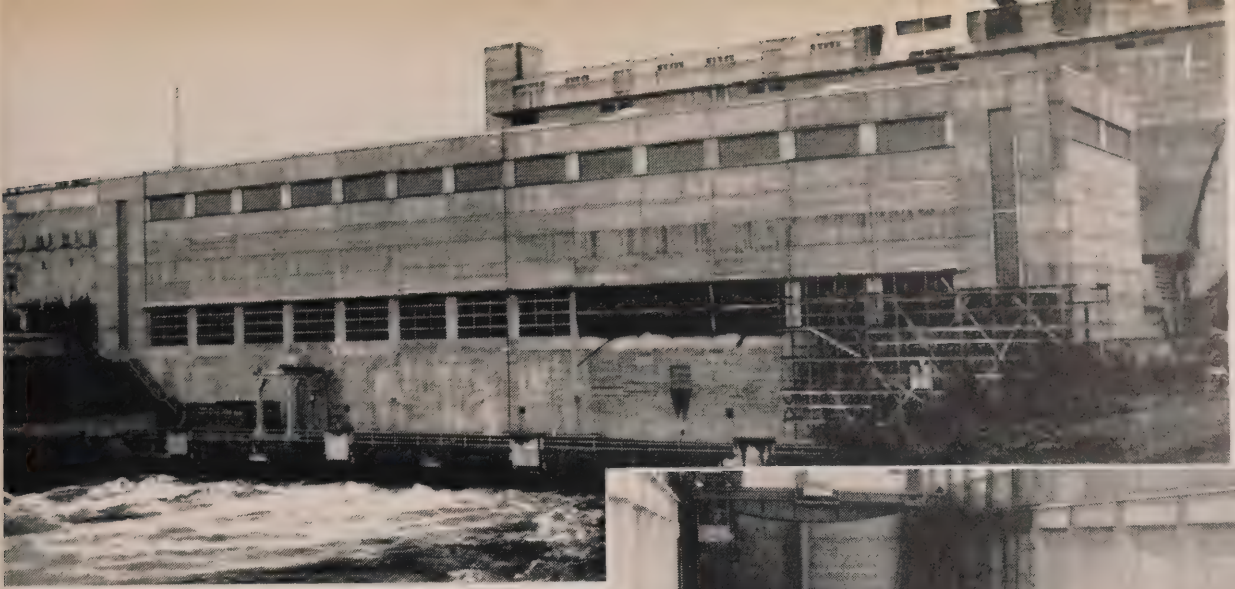
### Generators Not Damaged

By the use of carbon-dioxide, however, these retarding factors are overcome. CO-2 will not damage the generator and the unit can, therefore, be returned to service as soon as any repairs or replacements are completed. The necessity for a "dry-out" run is thereby eliminated.

At Pine Portage — similar systems are being installed at the Sir Adam Beck-Niagara Generating Station No. 2 and are either planned or in service at other Hydro developments — carbon-dioxide cylinders are stored in an equipment room on the operating floor of the powerhouse. A total of 2,600 pounds of the gas is stored in 52 cylinders divided into two separate banks.

The initial bank consists of 29





cylinders. When trouble develops in any one of the generating units, the entire supply of carbon dioxide from this bank is released into the generator within one minute. In this way the 25-percent concentration required to extinguish the blaze is reached quickly.

At the same time, the 23 cylinders comprising the second or delayed bank are also brought into service. But, due to the fact that the release nozzles and pipes leading to the generator are considerably smaller than those on the initial bank, close to half an hour will elapse before the gas is fully discharged. The main purpose of this delayed bank is to replace gas leakage and thus maintain the 25-percent concentration of CO-2, during the period when there is still the possibility of re-ignition.

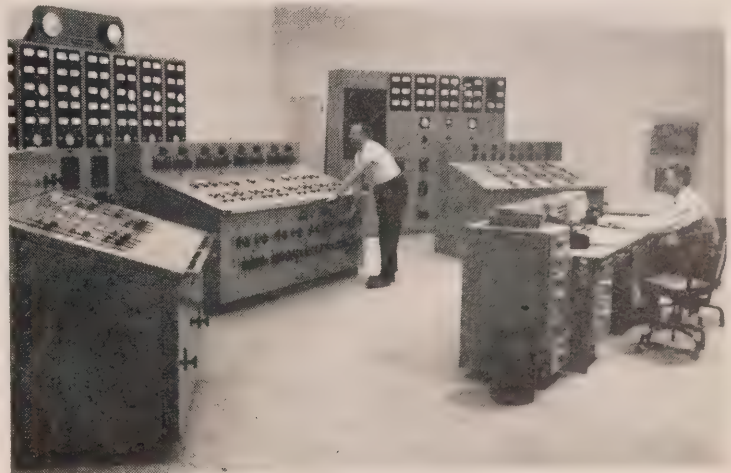
#### Four Different Releases

The release of carbon-dioxide is actuated by four different methods, two of which are the result of automatic detection devices, while two are manual. The automatic detectors are incited by either electrical or mechanical faults in the generator. For instance, if a short circuit occurs, a state of unbalance in the electrical system will be set up. Such a disturbance will be recorded by means of a split-phase protection de-

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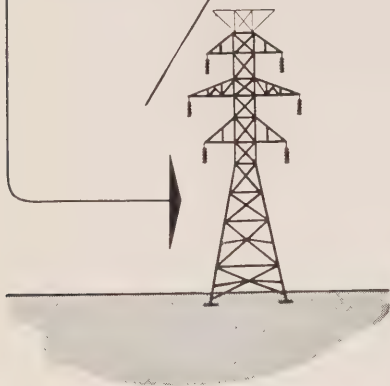


HYDRO'S most northerly Nipigon River development, Pine Portage Generating Station (upper photo), is equipped with the carbon-dioxide fire protection system. Two-unit addition to this station (lower photo), was completed in 1954.



GREEN light, visible in the control rooms of Hydro generating stations equipped with carbon-dioxide systems, such as Des Joachims Generating Station (above), indicates system stands ready to operate in case of emergency.

# ALONG HYDRO LINES



## Barrie P.U.C. Employee Receives C.E.A. Medal

At a meeting of the Town Council of Barrie on March 14, Marvin Hobson, sub-foreman with the Barrie Public Utilities Commission, was presented with the Canadian Electrical Association medal for the successful resuscitation of Wesley E. Symes, lineman, also with Barrie P.U.C. The presentation was made by D. A. Cameron, Secretary-Treasurer and Engineer of the Electrical Employers Association of Ontario.

On September 25, 1954, Mr. Hobson was helping Mr. Symes change a power service on the latter's house. Mr. Symes was on a ladder, attempting to disconnect the existing service, when he was attacked by a hornet. In the ensuing confusion, Symes touched a 120-volt wire with one hand and a grounded pipe with the other. He fell to the ground unconscious and not breathing. Mr. Hobson immediately commenced resuscitation and after about 20 minutes the injured man was able to resume normal breathing.

## Brantford Drops Deposit Interest

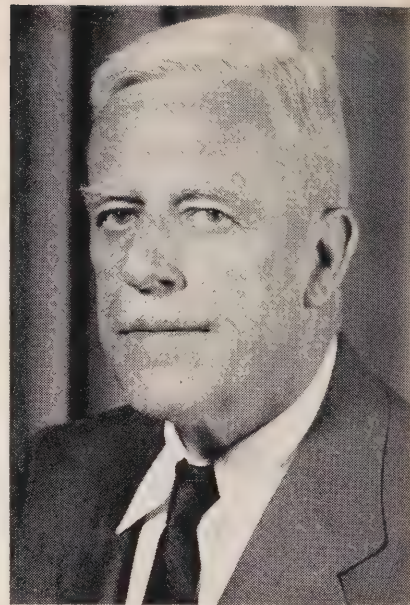
Brantford Public Utilities Commission recently ended payment of interest on customer deposits because of an uneconomical amount of paper work connected with the payments. The P.U.C. also made changes in tenant customer deposits for Hydro service, increasing the deposit for a two-wire service from \$3 to \$10. The \$5 deposit per 10,000 watts of connected load for commercial customers was confirmed.

## Long-Service London Commissioner Dies

Described as a man "with a keen sense of public responsibility," J. Bevan Hay died recently at London after 17 years' continuous service on the London Public Utilities Commission, including nine years as Chairman. Mr. Hay was Chairman of the London Commission from 1939 to 1944 inclusive, and again in 1948, 1952 and 1954. A few weeks prior to his death, Mr. Hay was elected to the London Commission by acclamation for another two-year term of office. A prominent London businessman, Mr. Hay also served with distinction on the Board of Governors of the University of Western Ontario, and was active in many fields of social, welfare and philanthropic work.

## St. Thomas Retires \$4.49 Truck

St. Thomas Public Utilities Commission is going to replace a truck worth \$4.49. The wear and tear of time has caught up with a 25-year old winch truck, which has depreciated annually until listed on the St. Thomas Commission's books as worth less than five dollars. The commission readily agreed to purchase a new truck after it learned, among other things, that the old machine has already broken six axles, and that no more are available.



D. S. ELLIS

## Queen's Science Dean Passes

Dean of the Faculty of Applied Science at Queen's University, Douglas S. Ellis, died suddenly at his home in Kingston on March 20.

Consultant with Ontario Hydro and the Canadian Government on several occasions, Dean Ellis was one of Canada's best known civil engineers. Born in Cobourg, he graduated from Queen's University and was associated with the university's applied science faculty for 45 years, with the exception of the years 1915 to 1919, when he served overseas, and a year spent in postgraduate work.

## First-year Chairman Dies at Belleville

Serving his first year as Chairman of the Belleville Utilities Commission, Urias "Sandy" Lummiss died recently at the age of 59. A former city alderman, who took a keen interest in the civic, community and sports affairs in the city, Mr. Lummiss was elected to the commission in 1954, and was named Chairman for 1955. He was an active member of the Belleville District Fish and Game Club, and was well-known for his keen interest in outdoor sports.





## BACK IN "HYDRO" HARNESS

**W**ILLIAM R. STEWART, who retired in 1949 as Manager of North Bay Hydro Commission after a lengthy association dating back some 43 years, is back in "Hydro" harness. A few weeks ago he became the first Chairman of the newly-formed West Ferris Hydro-Electric Commission when that body held its inaugural meeting. Another member of the new commission is R. H. Stafford, who, like Mr. Stewart, is a retired Hydro employee. Mr. Stafford commenced work with Ontario Hydro in May, 1918 as Manager of the Municipal Department in North Bay. He remained in that position until February 1, 1941 when he was transferred to the position of Maintenance Superintendent of Sudbury and Nipissing Districts. In April, 1948 he was appointed to the position of acting Area Manager for the North Bay R.O.A., from which position he retired in May, 1950. Formation of the new commission was approved by West Ferris voters at the municipal elections in December, 1954, following purchase of the system from Ontario Hydro a few months previously (see *Ontario Hydro News*, May, 1954). The group above includes, left to right: Reeve W. W. Quirt, Mr. Stafford, Township Clerk William Geden, Mr. Stewart, W. A. Barkhouse and Donald Simms, lineman and billing clerk, respectively. (Photo courtesy of North Bay *Nugget*).

### Trafalgar Installs Heater Controls

Installation of automatic controls for flat rate water heaters by the Trafalgar Public Utilities Commission will effect a 10-percent saving in the commission's peak-load billing from Ontario Hydro. According to P.U.C. Manager Harvey Philip, the new controls are lowering the daily peak by some 280 kilowatts. Used only during the evening peaks, the controls cut off the heaters for approximately an hour-and-a-half. Mr. Philip said the new system would have the effect of eventually lowering all bills in the township, without appreciably affecting the amount of hot water available to those using the flat rate heaters.

### Peterborough U.C. Increases Facilities

Erection of a new \$120,000 substation in Peterborough, and electrical servicing of 200 new homes in the city, will bring the Peterborough Utilities Commission's capital expenditures for electrical equipment during 1955 to an estimated \$442,460. For all services including waterworks and gas departments, the commission will spend an estimated \$642,780 this year, an increase of \$205,000 over 1954. The new substation — which will serve the city's downtown area — and the provision of services for new homes, are the major items in the 1955 budget recently approved by the commission.

### Name Hamilton Project Manager

H. L. Watts, P.Eng., has been appointed Project Manager for Ontario Hydro's frequency standardization program in the City of Hamilton and surrounding municipalities. Mr. Watts has been acting Project Manager since last November when Alvin G. Brenneman relinquished the position to assume the duties of Operations Engineer of Hydro's Georgian Bay Region.

Born in Toronto, Mr. Watts attended King Edward Public School and St. Andrew's College. Graduating in Metallurgy from the University of Toronto, he entered government service, becoming assistant to the Chief of the Bureau of Mines at Ottawa. Mr. Watts served with the Bureau from 1938 to 1948, with the exception of 5½ years during World War II, when he was on overseas service with the Royal Canadian Engineers, holding the rank of Major on demobilization.

After a year with the Central Mortgage and Housing Corporation, he joined Hydro's Frequency Standardization Division, serving as assistant project manager to Mr. Brenneman during the changeover to 60 cycles of London, Windsor, and surrounding districts, and then Hamilton.

### Helicopter Patrol "Sees Red"

One of Hydro's helicopter patrols "saw red" recently, while making an aerial survey of transmission lines in the Muirkirk district, near Chatham. Pilot Stan King and Gerry Hankinson, observer, spotted a red object hanging on one of the high-tension towers. Investigating, they found that a U.S. Marine Corps radiosonde unit — a miniature radio transmitter used for weather observations — had come down on the tower, leaving remnants of the red balloon, which carries the unit, clinging to the tower structure. Shroud lines had broken, plunging the unit to the ground.

## PATHWAYS TO POWER

*(Continued from page 18)*

duties, the future Capital Construction program is forecast in terms of annual and long-range budgets and work load forecasts are made for the various departments of the Commission's Engineering and Construction Divisions. Another forecast details the requirements of the program for major equipment that may take longer to procure than the time required to plan and construct the facilities for which the equipment is required. Such forecasting of equipment needs permits bulk purchasing with attendant saving in processing costs and purchase prices.

The Capital Construction program is relatively large, containing about 2,500 individual projects, of which about 1,000 are in fully active stages, ranging in value from a few thousand dollars to several millions. In order to schedule, follow up, expedite and co-ordinate a program of this size economically it has been necessary to develop uniform procedures for all work. All projects are scheduled individually, with the schedules for the larger ones complete in all significant detail through both the design and construction stages. On an average, progress is checked weekly against the schedule, although the checking periods are dependent upon the stage of the project. Progress is reported monthly for all projects, with attention being directed to actual or impending departures from the schedule that are important. As circumstances require, the individual project schedule is revised and re-issued after consultation with and agreement between the Engineering and Construction Divisions.

### Estimating and Cost Control

Estimates are an integral part of planning and subsequently a target by which a project is controlled. Planning requires estimates for comparative purposes to provide the information necessary for economic studies and decisions.

Requests for estimates are in-

itiated in connection with new capital construction. These requests are directed to each participating department of the Engineering Division with copies to other interested departments. The request for an estimate will include basic information and specifications, and will specify the type of estimate required, together with the scheduled in-service date for the project.

Each department of the Engineering Division will investigate the site and conditions, prepare specifications, basic design, and its share of the estimate which will include permanent material requirements and engineering services. They will, in turn, request other participating departments in the form of specifications, plans and quantities for their contribution, and upon receipt of this information will assemble the estimate. This information is co-ordinated and reviewed and assembled into the proper form before submission for approval.

Upon receipt of the approval, the necessary work orders are issued. The work orders are accompanied by a detailed performance estimate, as approved, for transmittal to the various participating departments. The work order will constitute their authority to proceed with their particular portion of the work in accordance with their prior commitments and the schedules.

During the progress of the work, each participating department in charge of a particular phase of the work will be responsible for controlling the actual job costs.

Cost control responsibilities parallel the responsibilities involved in preparing the estimate and carrying out the work. This cost control function is exercised by comparing the actual cost with the estimated cost for each work item, as the job progresses. The basis for this comparison will usually be the unit cost (ratio of actual or estimated cost to actual or estimated quantity). Thus, any variance from the estimate can be spotted at once. If an over-ex-

penditure is indicated, immediate steps can be taken either to correct the situation in the field or to requisition additional funds to cover the expected deficit. In this connection, the necessity for prompt and accurate reporting of field costs is readily apparent ■

## SILENT FIREMEN

*(Continued from page 21)*

vice and will be transmitted to the fire protection system. Similarly, should a mechanical failure develop which might give rise to friction and result in incandescence, thermostatic controls in the hot air circuit of the cooling system detect the fault and trip the extinguishing system.

Should either of these methods fail to operate, remote, manual switch-operated stations are installed for each generating unit. An operator, after observing any trouble, simply breaks the glass and trips the switch to release the carbon-dioxide. Finally, there is a straight manual operation which would be necessary if all three former devices failed to actuate the system.

Any one of the first three methods automatically starts a siren in the unit to warn operators that trouble has developed. A workman in the turbine pit would also be able to get out in time to avoid injuries. At the same time, lights in the control room indicate that the fire protection system is in operation. A green light, which is normally on to indicate that the system stands ready to operate, will suddenly blink out and a flashing red light will come on, signifying that carbon-dioxide has been released into the unit indicated. Should a continuous red light show, the operator is warned that the fire protection system is blocked out so that it cannot be actuated automatically or remotely from the "break-glass" station.

Thus, these silent firemen are standing guard day and night over precious equipment that means power for Ontario. ■





# **NEVER TOUCH a fallen wire!**

One reason why electricity serves us so well is that it can be delivered wherever wires will carry it.

Ontario Hydro exerts every effort to keep safe the wires that carry this important commodity, but in spite of all precautions, lines occasionally break. A fallen wire is dangerous . . . it may be a "live wire".

*Never touch a fallen wire under any circumstances!*

Warn children not to go near them. If you find an electric wire on the ground, or dangerously low, please notify the nearest Hydro office and endeavour to keep others away until service men arrive. Your co-operation may be instrumental in saving a life.

**ONTARIO HYDRO at WORK for YOU and YOURS**

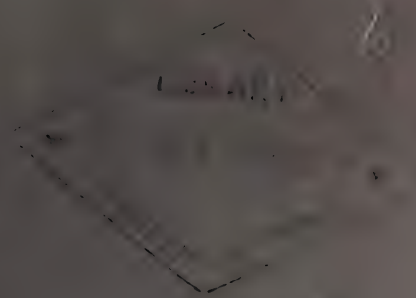




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## PROFOUND IMPACT

CANADA'S rich store of natural resources undoubtedly has been the motivating factor behind her emergence as the world's third trading nation and her rank as sixth among the manufacturing nations. It is not difficult, however, to find evidence of the striking influence of low-cost electrical power on the development of these resources.

Addressing a Peterborough audience recently, A. M. Doyle, a Vice-President of the Canadian General Electric Company Ltd., said that "cheap power is the major reason that Canada has been able to compete on the world market and still pay wage rates several times those paid in European countries."

Supplementing the productive capacity of Canada's relatively small population has been the output of her electric generating stations. The total capacity of Canadian hydraulic plants now stands at more than 16,600,000 horsepower. According to Mr. Doyle, each horsepower is equivalent to 10 men doing 24 hours of hard labor. In his address, Mr. Doyle emphasized that electricity, apart from its vital effect on the development of Canada's natural resources, has had a profound impact on the daily lives of thousands of Canadians. Through electricity, the country home has been converted to a city dwelling while the barn has become a miniature factory. It has been estimated that there are some 400 possible electrical applications on the modern farm to ease the farmer's work load and to increase the production of many commodities. The ready availability of low-cost power has created a demand for many new types of appliances and equipment in the home, as well as in commercial and industrial premises. This has, in turn, promoted the growth of the Canadian electrical industry. In Ontario alone, the manufacture of electrical equipment supports directly and indirectly more than a half-million people, Mr. Doyle stated.

There is, happily enough, no foreseeable limit to the development of further useful and labor-saving equipment, which presages not only a continuing but, moreover, an increasing use of electricity by the average domestic customer. Mr. Doyle told his audience of several new electrical applications soon to be released on the market such as a kitchen service centre which will incorporate a sink, built-in garbage disposal unit, electric washer and drying equipment, electric refrigerator and other kitchen essentials. Color television screens and electric refrigerators, which will hang from the wall, are other interesting electrical devices of a few years hence. Mr. Doyle also predicted that combined air-conditioning and heating equipment would, in time, be virtually universal for new residences in some parts of Ontario, while illuminated walls and ceilings, simulating the effects of daylight, may furnish lighting for the Canadian home of the future.



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### COVER PHOTOS

CENTRE Island, bounding Toronto Harbor on the south, offers a fine vantage point, particularly at night, to view the city's skyline. Our front cover this month shows only the central downtown section of the Queen City, but we think it's sufficient to prove that Ontario's capital is well-lighted.

In more rural vein is the peaceful scene on our back cover which was recorded by a Hydro staff photographer on Highway 7 east of the City of Peterborough.

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The two recent appointees to the expanded Ontario Hydro Commission — Hon. William E. Hamilton, M.L.A., Vice-Chairman, and Lt.-Col. A. A. Kennedy, D.S.O., E.D., Commissioner — are shown as they attended their first Commission meeting on May 11. With Dr. Richard L. Hearn, Chairman, presiding at the far end of the table, the group includes, left to right: E. H. Banks, Assistant General Manager and Comptroller; J. M. Hambley, Assistant General Manager — Administration; E. B. Easson, Secretary of the Commission; Lt.-Col. A. A. Kennedy, Commissioner; W. Ross Strike, Vice-Chairman; Dr. Hearn; Hon. George H. Challies, retiring Vice-Chairman; Hon. William E. Hamilton, Vice-Chairman; Dr. Otto Holden, Chief Engineer; A. W. Manby, General Manager; G. D. Floyd, Assistant General Manager — Engineering; and John Dibblee, Assistant General Manager — Personnel.

## NEW VICE-CHAIRMAN AND COMMISSIONER APPOINTED



HON. WILLIAM E. HAMILTON, M.L.A.  
Vice-Chairman

EARLIER THIS MONTH, Ontario Hydro welcomed two recent appointees to the expanded Commission — the Hon. William E. Hamilton, M.L.A., Vice-Chairman, and Lt.-Col. A. A. Kennedy, D.S.O., E.D., Commissioner.

Mr. Hamilton, Minister without Portfolio in the Executive Council of the Ontario Legislature, succeeds the Hon. George H. Challies, who has tendered his resignation to become the first Chairman of the newly-formed Ontario-St. Lawrence Parks Commission.

Mr. Hamilton assumes his new position with a lengthy record of public service and experience in the business field. Born at Guelph, Hydro's new Vice-Chairman received his primary and secondary education in that city. He also attended the Ontario Agricultural College at Guelph.

He has taken a prominent role in philanthropic and club endeavors for the past 15 years and, on several occasions, has served as Chairman of such Guelph organizations as the Y.M.C.A., Red Cross, Boy Scout Association, and the Community Chest. Married in 1930, Mr. and Mrs. Hamilton have five children.

First elected to the Ontario Legislature to represent the constituency of Wellington South in 1945, Mr. Hamilton was named Minister of Reform Institutions in 1949. In 1950 he resigned from this post, being appointed Minister without Portfolio at that time. He is, at present, a Lieutenant in the Artillery Reserve.

The other new appointee to the Ontario Hydro Commission, Lt.-Col. Kennedy has been actively identified with the public and busi-

*(Continued on page 23)*



LT.-COL. A. A. KENNEDY, D.S.O., E.D.  
Commissioner

# HIGHER STANDARDS *at lower cost*

**Long-range program of standardizing Hydro's equipment, materials and supplies paying rich dividends in increased economy and efficiency**

**I**T MAY come as a surprise to many to learn that Ontario Hydro actually has two programs of standardization "in hand" at the moment.

One, of course, is the now-familiar frequency standardization project to alter the frequency-sensitive equipment and appliances of some 989,569 customers from 25 to 60 cycles in a 12,000 square-mile area of Southern Ontario.

Although totally different in

character, the second Commission standardization project is of parallel significance in many respects. It is, to put it briefly, an organized plan to standardize, where possible, the type of equipment, materials, and supplies that Ontario Hydro uses in its province-wide operations.

Maintaining an adequate stores stock of materials and equipment for the multitude of jobs involved is neither a simple nor a minor task.

Confirming this is the fact that, during 1954, approximately 52,589 orders were filled by Hydro's Central Stores, main supply source for the Commission. These orders had a total weight of some 52,515 tons, and an approximate value of \$17,281,400. In the first four months of 1955, Central Stores has processed 23,615 orders. Further emphasis is furnished by Hydro's Catalogue of Standard Material and Equipment, which lists a wide variety of items ranging from flashlights to 100-kva transformers, from sandpaper to wood poles, and from plastic tableware to railway track.

Celebrating its fifth birthday this month, this important standardization program was inaugurated in May, 1950, with the formation of a group designated as the Standards Committee and representing several key divisions of the Commission.

First Chairman of the committee was R. B. Young, Associate Director of Research at that time, and later consulting engineer on concrete. On Mr. Young's death in 1954, M. J. McHenry, assumed the chairmanship and the committee now consists of: F. H. Chandler, Vice-Chairman; M. G. Fiegehen, (alternate—C. C. Boyle); W. C. Cunningham, (alternate—W. J. Vance);



MEMBERS of the present Standards Committee, reading clockwise: J. R. Findlater, W. C. Cunningham, H. P. Cadario, R. N. Kirby, F. H. Chandler, Vice-Chairman; M. J. McHenry, Chairman; C. C. Boyle, Secretary; C. B. Sharpe, J. E. Sproule, M. G. Fiegehen, and H. C. Ross discuss a new standard specification, one of 60 material specifications adopted to date.





MOBILE crane stacking reels of heavy conductor (above), and lift trucks loading supplies destined for regional and area operations throughout Ontario on the transport vehicles (below) illustrate the variety and volume of materials handled by Hydro's Central Stores.



J. E. Sproule, (alternate—W. J. Baxter); H. P. Cadario, (alternate—W. E. Taylor); C. B. Sharpe, (alternate—N. D. Lindsay); I. C. Ingimundson, (alternate—R. N. Kirby); J. R. Findlater, (alternate—J. R. Gammage), and H. C. Ross, (alternate—William Dowds). C. C. Boyle, Supply Control Department, is the permanent Secretary of the committee. These committee members represent the Supply Control and Purchasing Departments (Supply Division); Electrical Engineering Department (Engineering Division); Operations Division; Frequency Standardization Division; Construction Division, and the Research Division.

#### Five Main Purposes

The Standards Committee has five main purposes: to subdivide materials into classifications for the purposes of cataloguing and records; to determine and to foster use of a standard terminology in the description of all materials; to establish adequate material specifications;

*(Continued on page 4)*



CODE numbers on each bin and shelf at Central Stores depot have speeded up the job of filling thousands of orders. Here Stockkeeper Bill Silliphant selects a compression sleeve, checking the code number on the bin with the number indicated on the requisition form he is holding in his hand.



to minimize the number of different items purchased by eliminating superfluous types and sizes, and to co-ordinate, to the greatest possible extent, the Commission's standards with those established by nationally recognized organizations, such as the Canadian Standards Association, American Standards Association, American Institute of Electrical Engineers, and the American Society for Testing Materials.

Responsible for establishing the broad policies of standardization within its scope, and for ensuring that these policies are followed, the Standards Committee has, in the past five years, appointed 22 material committees to study and standardize specific classes of materials, equipment and supplies. Each committee is composed of representatives of the "using" departments. While the Standards Committee is the governing body, much of the actual work falls to these material committees.

Some of the main problems involved in the actual work of standardization are: determining whether an item is really necessary for Commission use; selecting the item which will meet job requirements adequately at the lowest ultimate cost; eliminating obsolete items and unnecessary types and sizes; considering and evaluating new products, including substitutes which may be economically advantageous and equally satisfactory; co-ordinating recommended standards with appropriate national standards, and employing them to eliminate special designs; establishing standard terminology for all items, and classifying them in terms of the Commission's Material and Equipment Classification, and developing new or revised Commission specifications

which will incorporate the results of standardization.

### Detailed Study

This has meant hours of detailed study and consideration by members of the Standards Committee and the material committees. Since the inauguration of the program, the Standards Committee has held 56 formal meetings while the 22 material committees have held a total of 594 meetings. In addition, several special assignments have been filled by individual committee members.

But it has been time well spent. The Standards Committee can produce many concrete examples of benefits resulting from this standardization program.

Since the Standards Committee was formed in 1950, some 12,757 items have been coded and catalogued. Acting upon the recommendations of the material committees, it has been possible to gradually eliminate 3,364 of these items. Today, therefore, coded and catalogued items total 9,393, of which 776 are not required in sufficient quantity to warrant stocking. Another 426 items are scheduled for elimination after present stocks are exhausted.

There are numerous specific examples of reductions in the number of items of various types effected by this standardization process. For instance, five sizes of socket eyes, or ball socket adapters as they are sometimes called, have been adapted for applications which formerly required a range of 18 sizes. The eliminated ball socket adapters were reclaimed by changing the size to conform with the new, standard sizes adopted, thus effecting a net saving of about \$12,000. Today, two "dead - end" clamps serve instead of eight, and also will replace a number of conductor clamps. In the past five years, 38 sizes and types of wire and cable, mainly ACSR conductor, have been reduced to 24 sizes and types, including three new items which were adopted.

In many instances, the economic benefits of standardization, while substantial, are still intangible. In other words, it is hard to lay a finger directly on a saving, even though it is known to be there. But, on many items, the saving is expressed in dollars and cents.

For example, adoption of a standard fire extinguisher for all Hydro vehicles eliminated a special type of extinguisher, saved approximately



ELECTRICAL Foreman R. W. James demonstrates the standard fire extinguisher approved for use on all Hydro vehicles.

\$55,000, and forestalled future high maintenance costs. Replacement of a high-priced padlock with a better type costing two-thirds less, has saved the Commission an estimated \$12,000 annually.

Nothing is static in the committee's operations. Acting upon the advice of the material committees, it is constantly seeking and finding economical methods of disposing of obsolete or unnecessary items, and adding new types and ranges of sizes. This continual readjustment results in better products which prove cheaper and more efficient on a long-range basis. In addition, numerous items in considerable demand, but previously purchased only when required, are being adopted as standard stores items to obtain the benefits of bulk purchasing. It is the ultimate aim of the Standards Committee to code and catalogue virtually every item purchased by the Commission in order to arrive at a standard nomenclature and ordering description.

### Catalogue Revision

A striking feature of the standardization program is the continuing revision of the Catalogue of Standard Material and Equipment. This volume was published first in 1948 to keep users informed of the items available in stock and to aid them in making selections best suited to the needs of the work for which they are responsible. Today, with a 22-page index, it contains 56 classifications, broken down into more than 225 sub-classes. Most of the items, each of which bears a code number to facilitate ordering, have an accompanying illustration.

Until the organization of the Standards Committee, revisions to the catalogue were made on a question-and-answer basis, one item at

*(Continued on page 6)*

MAY, 1955



CECIL TRAVERS, sub-foreman stockkeeper at Central Stores, examines the five sizes of socket eyes selected for applications formerly requiring a range of 18 sizes. They are used for adapting varying sizes of insulators and other hardware in line construction operations.



STOCKKEEPER Eric Hinton demonstrates the standard padlock selected for use on Commission gates. The new type costing two-thirds less than the padlock used formerly for this purpose, is estimated to have saved \$12,000 annually and has given equally satisfactory service.





MISS Grace Jones, of Hydro's Supply Control Department, checks a Catalogue of Standard Material and Equipment, which lists a total of 9,393 items, each bearing a code number to facilitate accurate ordering.

a time, in consultation with the "using" departments. Since the formation of the material committees, revisions of each class and sub-class have been controlled systematically and integrated in an orderly manner, with consequent improvements in classifications. More accurate nomenclature and detailed descriptions have increased the usefulness of the catalogue.

The first issue of the catalogue went to a mailing list of 245 Commission representatives. Today, it reaches 855 Commission departmental representatives, including Hydro's Head Office, regional and rural operating area offices, construction superintendents, and all planning, designing and material ordering groups. Mailing lists are reviewed carefully, all unused catalogues being recalled, revised and re-issued as required.

Hydro's Supply Control Department is responsible for production of the catalogue, but the information required in rewriting the various classes comes from the material committees. To maintain the close co-operation necessary in this important work, C. C. Boyle, a member of the Supply Control staff serves as permanent secretary of the Standards Committee, while four other representatives of this department, namely: R. A. Gleeson, W. T. Gresham, W. K. Glen and J. D. Hamilton, are permanent secretaries of the various material committees. Since these committees were organized, this teamwork has resulted in nearly every class being rewritten and re-issued on the average of three times apiece. Obsolete pages can be removed and new, revised pages inserted in the loose-leaf catalogue with little or no difficulty.



The loose-leaf method was devised by the Standards Committee on the well-founded supposition that revisions, like the process of standardization itself, would be on a "belt-line" schedule as long as new and improved products for Commission purposes appear on the market, or until the Standards Committee finds a substitute for this valuable reference manual.

#### Developing Specifications

Another significant function of the Standards Committee is the development of new or revised specifications for equipment which will incorporate the results of standardization. The committee generally favors adoption of a national or recognized specification for use wherever possible. If no adequate specification exists, a Commission standard specification is produced and used until such time as an adequate national specification becomes available. Copies of such Commission specifications are supplied to the Canadian Standards Association and the Canadian Government

Specifications Board for their information.

The work of reviewing and re-writing specifications for materials is carried out by the Specification Engineer, Standards, E. L. Hartman, under the direction of the Chairman of the Standards Committee. Mr. Hartman works co-operatively with the material committees in the reviewing of existing national specifications and in the preparation of new Hydro specifications.

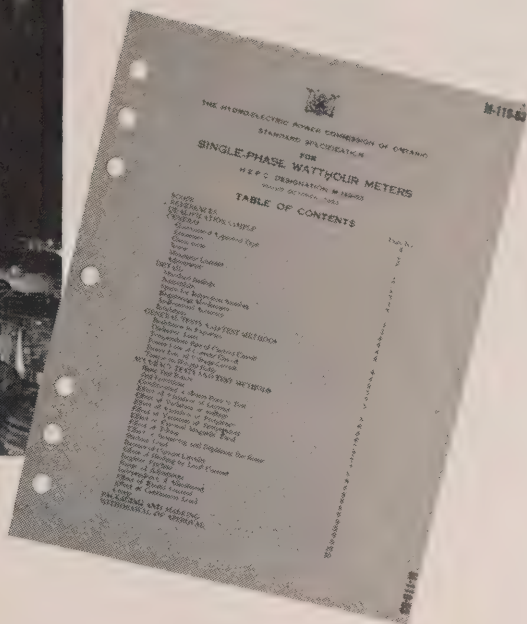
Progress in this direction has been steady and is continuing at an accelerated pace.

In 1950, the Commission was using approximately 25 specifications, produced by various national or technical associations, for reference in purchasing material. A total of 16 material or equipment specifications written by various departments of Ontario Hydro was also in use, together with some 400 departmental design drawings. Additional information was included in the purchase order as necessary.





△ DEVELOPMENT of new or revised specifications for such Commission equipment as these single-phase watt-hour meters displayed by Robert Kelly, stockkeeper in the meter shop at Hydro's A. W. Manby Service Centre, left, constitutes one of the major functions of the Standards Committee. Cover page of the specification for this type of meter is reproduced below.



The national specifications have been reviewed and re-affirmed, where appropriate, with latest revisions. Six new standards of the Canadian Government Specifications Board have been adopted, replacing Commission specifications in five cases. A total of 60 Commission material specifications has been adopted to date, while 90 more are under consideration. In addition, 10 standard workmanship specifications, originating with a special committee on "Roads," have been processed through the same administrative machinery and issued with standard forms and numbers. The 400 design drawings still used for purchasing are being reviewed with the objective of revising and combining them to form self-sufficient specifications.

A specific example of the benefits being derived from the development of up-to-date specifications can be found in the single-phase watt-hour meter, which records, with astonishing accuracy, the amount of electricity consumed by the greater

proportion of Ontario Hydro's rural customers.

The Commission buys some 35,000 of these single-phase meters a year from six Canadian manufacturers. Up until last year, however, the meters were of varying design and quality. Repairs were costing in the neighborhood of \$100,000 annually. At the request of the Standards Committee, Ontario Hydro's Research Division went to work on the problem.

Based on the findings of the research engineers, the Standards Committee prepared specifications for a standard, single-phase meter. These specifications were accepted by the manufacturers, and the accurate product, now in use, saves Ontario Hydro considerable money. Although the performance of these new meters is still under close scrutiny, tests to date indicate continued economies in the future.

In a program of such a far-reaching nature, competent research and testing is vital. The Standards Committee has received valuable assistance from the engineers of Hydro's Research Division. In practically every case, new items and materials are thoroughly tested by the Research Division laboratories before acceptance by the material committees. Many of the old standard items are, similarly, re-tested to make certain they will stand modern requirements.

The long-term value of this standardization program to Hydro and its customers, cannot be estimated even approximately. It is evident, however, that a continuous program of detailed study of every item purchased in quantity cannot fail to pay large dividends, the results being reflected in the increased economy and efficiency of the Commission's technical operations. ■

# PATHWAYS TO POWER

## Chapter III

# HYDRAULIC DESIGN

By S. W. B. Black, B.A.Sc., P. Eng., Generation Dept.

NATURE HAS endowed the Province of Ontario with many rivers, rapids and falls, with a potential hydro-electric capacity of more than 9,000,000 horsepower. At the end of 1954, approximately 4,845,000 horsepower had been developed by utilities and companies throughout the province. An additional 2,000,000 horsepower is represented by projects now under construction by Ontario Hydro. Apart from the St. Lawrence, no further major hydro-electric sites are available in Southern Ontario. In Northern Ontario there are still untouched resources of 2,000,000 horsepower, much of which is regarded as possible of future economical development.

In southern Ontario, electric power is used principally in our factories, farms and homes, while in northern Ontario electrical services are primarily directed to the development of mineral and forest resources. The hydraulic engineer is charged with the conservation and economic development of water-power for the benefit of the people of Ontario.

Previous chapters have described, in some detail, geological and water supply factors, surveying and investigation of power sites, and the planning necessary to determine the



relation between available power and the power market. Here it is assumed that a particular site requiring development has been decided upon and that authorization has been received to proceed with the design and construction of the plant.

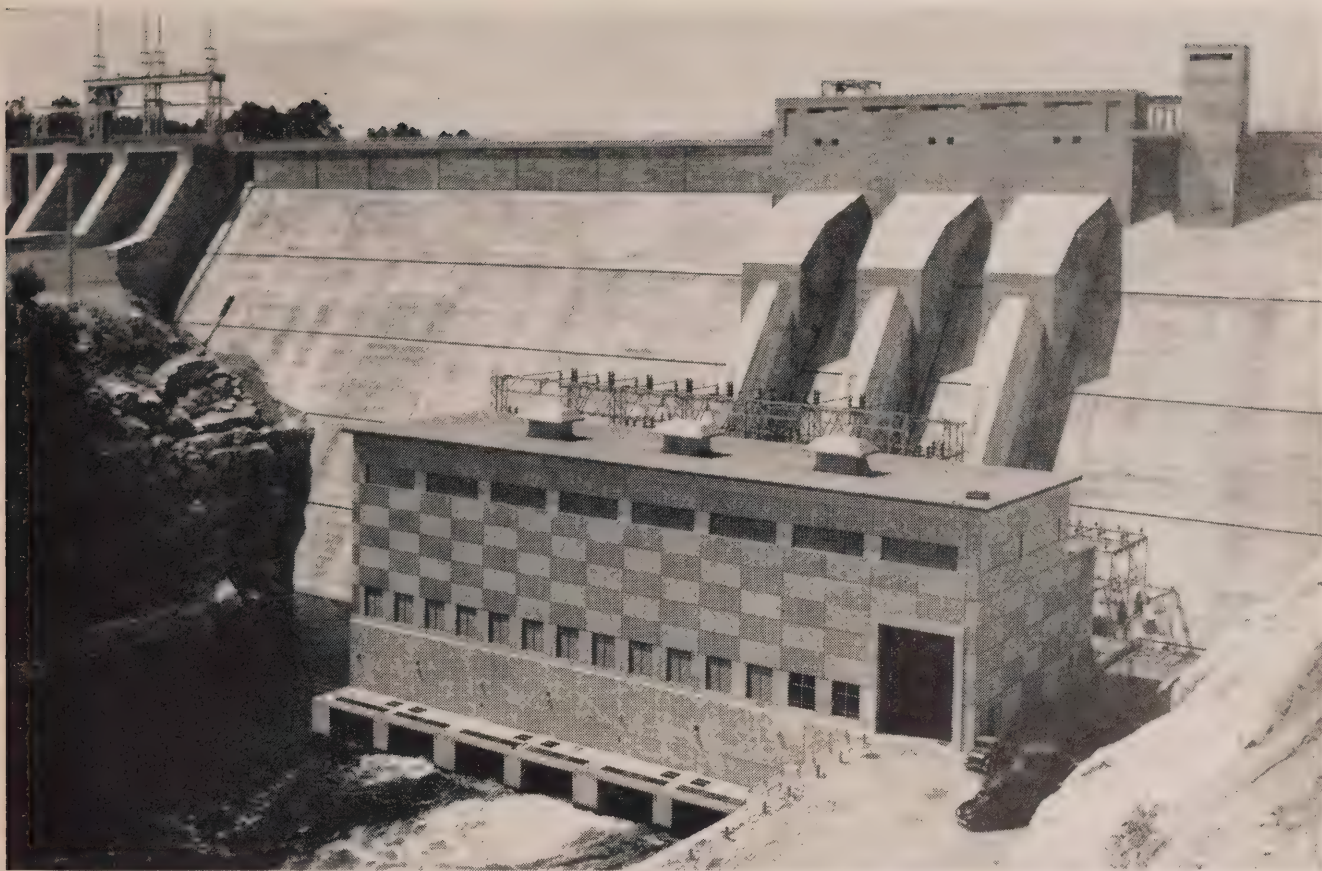
### Two Types of Development

Generally speaking, there are two types of hydro-electric development — high head and low head — and the division between these two types

may be set at approximately 80 feet. Three principal factors govern the economic cost of a development: the available flow (usually stated in cubic feet per second), the gross head (the difference in elevation between the upper level at the dam and the lower level at the powerhouse), and the topography of the site. It will be evident then that where there is a site with good water supply and high head combined with favorable topography, a very economical development may be expected.

The first step in the design of the plant is to assemble all data and information available. Over the past 35 years many surveys have been made by the Commission on the important power rivers of Ontario, and a large amount of data has been assembled, including available heads and flows. Alternative schemes of development for the site are now studied intensively and then the hydraulic, electrical and construction engineers visit the site to see, at first hand, the advantages and disadvantages of these alternatives. After carrying out further studies, a definite scheme of development is decided upon, although additional field information will probably be required before the various structures and channels can be located in their most advantageous position.





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HYDRO'S Stewartville Generating Station on the Madawaska River is a typical example of a modern hydro-electric plant. Operating at a head of 150 feet, three steel penstocks, 14 feet in diameter and 190 feet long, convey water to the turbines. The station, consisting of three water turbine-generators and auxiliary equipment with a total dependable peak capacity of 63,000 kilowatts (84,500 horsepower), was placed in service in September, 1948.

As stated before, the principle of conservation of power resources, within economic limits, must receive first consideration. At some sites practically the total head can be made available at the powerhouse, as at Chats Falls, while at others the distance the water has to travel between the farthest upstream works or intake and the powerhouse, as at our Sir Adam Beck-Niagara plants, may result in a substantial amount of lost head which is not economical to obtain.

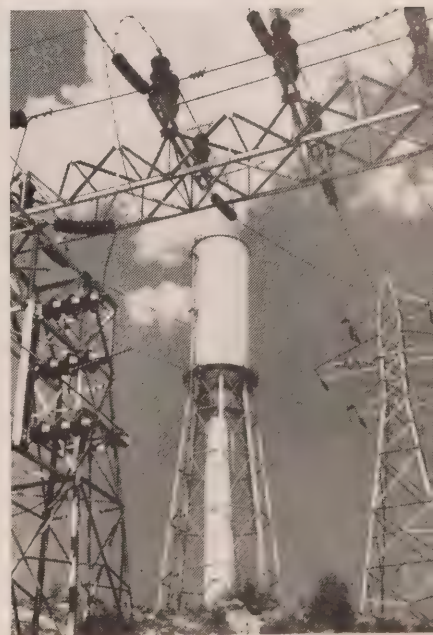
For major structures, such as dams and powerhouses, the location resulting in the minimum cost for the structure is usually the deciding factor. The height of the dam, which fixes the headwater level, is an important factor and is given

careful consideration. Flooding damages and additional cost of the dam itself may become large factors. Moreover, too high a head-water level may result in a reduction of head at the next site upstream. The economics of water conveying channels and pipe-lines, such as canals and penstocks (pipe-lines leading from the headworks to

*(Continued on page 10)*

WHEN water is conveyed to the turbines through long pipe-lines, a surge tank, located near the powerhouse, similar to this 240-foot high tank at Hydro's Aguasabon plant, is used frequently to supply water quickly to meet sudden load increases on the station, or to act as a reservoir for the rejected water when the load is reduced.

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POWER canal built about 35 years ago to convey water from the upper Niagara River to Hydro's Sir Adam Beck-Niagara Generating Station No. 1 just before the water was allowed to enter. This concrete-lined section is about nine miles long, involving the excavation of 3,840,000 cubic yards of rock and the placing of about 304,000 cubic yards of concrete.

the powerhouse) are studied. The head lost in friction, translated into power, is balanced against the cost of the channel or pipe-line.

With the total capacity of the site fixed, a selection of the number, and consequently the capacity, of the individual units is given consideration. Generally speaking, the larger the units, the lower the cost per horsepower of the turbines, generators and powerhouse. Often an even number of units is installed to effect a saving in auxiliary equipment.

In some instances, before proceeding with the detailed design of hydraulic works, it is found advisable to conduct model tests of certain channels and structures to determine their characteristics. These tests are usually carried out in a hydraulic laboratory.

While some developments do not include canals or other water-conveying channels, there are others where these water channels may account for a considerable part of the

cost of the whole development, such as at the Sir Adam Beck-Niagara Generating Station No. 1, where the canal from the intake at Chippawa to the powerhouse at Queenston, a distance of 13 miles, cost about \$45,000,000. In such an instance very careful study is given to the design of the canal to fix the allowable friction loss within economic limits. In comparison with this is the DeCew Falls development, where there is a considerable distance between the powerhouse on Twelve Mile Creek and Lake Ontario. The economics of such tailwater channels are also investigated, as a lower tailwater level at the powerhouse provides just as much additional head on the turbines as does a correspondingly higher headwater level.

With most hydro-electric developments a dam to raise and control the headwater level is required, although this structure may be built as an extension to the powerhouse in some instances. The dam is designed to satisfy the requirements of

stability against water pressure, ice thrust and up-life on the base. It must be able to pass the maximum flood flow with safety. Dams may be of concrete, earth-fill or rock-fill, or timber-crib construction, the choice of materials depending, usually, on local conditions.

### Headworks

The headworks or intake to the water passages leading to the turbines may be located in the dam structure, or may be an integral part of the powerhouse substructure. The intake facilities are usually of reinforced concrete construction and contain steel racks to prevent trash from entering the turbines, and headgates to shut off the flow of water to the units.

Pipe-lines or penstocks frequently are required to convey the water from the headworks to the powerhouse. They may be of steel-plate, reinforced concrete, or wood-stave pipe. Each type has its own particular advantage, both with regard



▷ SCROLL cases distribute the water to the turbine runner. The water, entering the speed ring (in which the three men are standing), passes through the vanes (A), and is controlled by the turbine gates (B) —shown in a closed position—before reaching the turbine runner.

▽ FORMS in position for two draft tubes at one of Hydro's new hydro-electric plants. The present trend in design is to follow a right-angled elbow turn. Function of the draft tube is to recover as much as possible of the energy remaining in the water after it passes through the turbine runner.



for the superstructure or building housing the generators and other electrical equipment. It is of massive, reinforced concrete construction.

### Turbine Equipment

A hydraulic turbine is a machine for transforming the energy of falling water into mechanical power. There are the fixed parts, which contain and guide the water to the water wheel or runner and the rotating parts, which include the runner and shaft.

Regulating the amount of water supplied to the runner are a number of gates, usually of the wicket type, and, controlling the operation of these gates, is a hydraulic governor to maintain the speed of the unit within narrow limits. For example, if more power is required from the unit, the rotating elements slow down perceptibly and the governor automatically opens the turbine gates to supply more water to the runner to take up the added load. This cycle is reversed when load is reduced on the unit.

While the turbine manufacturer

*(Continued on page 12)*

to cost and availability of materials. The penstocks are designed for the maximum internal water pressure which could occur, and a calculation of pressure rise resulting from the sudden closure of the turbine gates is required to determine their design.

With long pipe-lines, a surge tank, located near the powerhouse, is frequently used. This tank has two main functions — to supply water quickly to the turbine to enable it to take up sudden increase in load on the unit, and to provide a reservoir for the rejected water when the load is reduced.

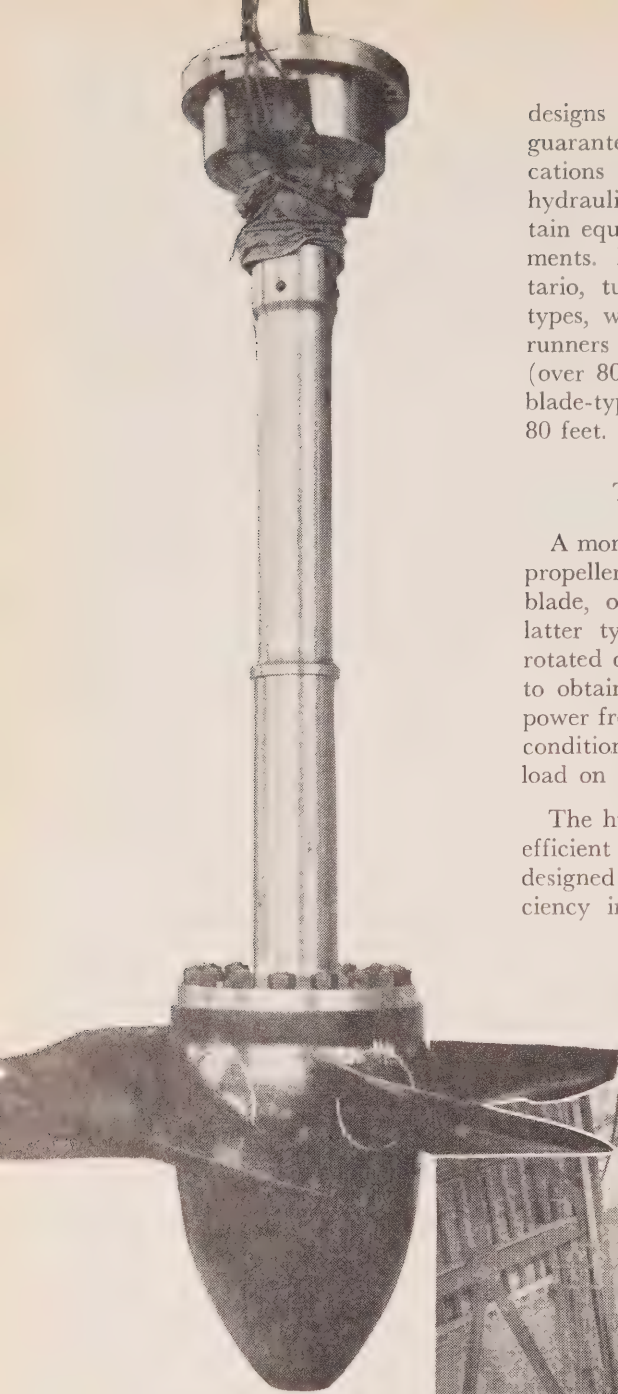
The powerhouse substructure is one of the major hydraulic structures in a hydro-electric development. It includes the scrollcase

(water passages leading to the turbines) and the draft tubes which convey the water from the turbines to the tailrace, immediately outside the powerhouse. The form of these water passages is usually given by the turbine manufacturer, and is developed after considerable experience with his own type of equipment.

### Function of Draft Tube

The draft tube's chief function is to recover a large part of the energy remaining in the water after it has passed the turbine runner. Numerous designs of draft tubes have been tried out in the past, but the present trend is towards a standard right-angled elbow type. The substructure also provides the foundations for the generators and





designs his own equipment and guarantees its performance, specifications must be prepared by the hydraulic engineer in order to obtain equipment to meet his requirements. For heads available in Ontario, turbines are of two general types, with Francis or bucket type runners for high-head installations (over 80 feet), or with propeller or blade-type runners for heads under 80 feet.

### The Kaplan Runner

A more recent development of the propeller type is the adjustable blade, or Kaplan runner. In this latter type, the runner blades are rotated on their axis, automatically, to obtain the maximum amount of power from the water under varying conditions of operating head and load on the unit.

The hydraulic turbine is a highly efficient machine when properly designed and installed — the efficiency in some instances reaching

94 percent, including draft tube losses.

The supply of water to the turbine is controlled by head gates located in the headworks at the upper end of a penstock, or by a valve located at the lower end of a penstock. The head gates are usually of structural-steel design, with rollers attached to enable them to be closed readily against the water pressure in case of emergency. Hoists are provided to raise the gates, but the gates are lowered by allowing them to drop under brake control.

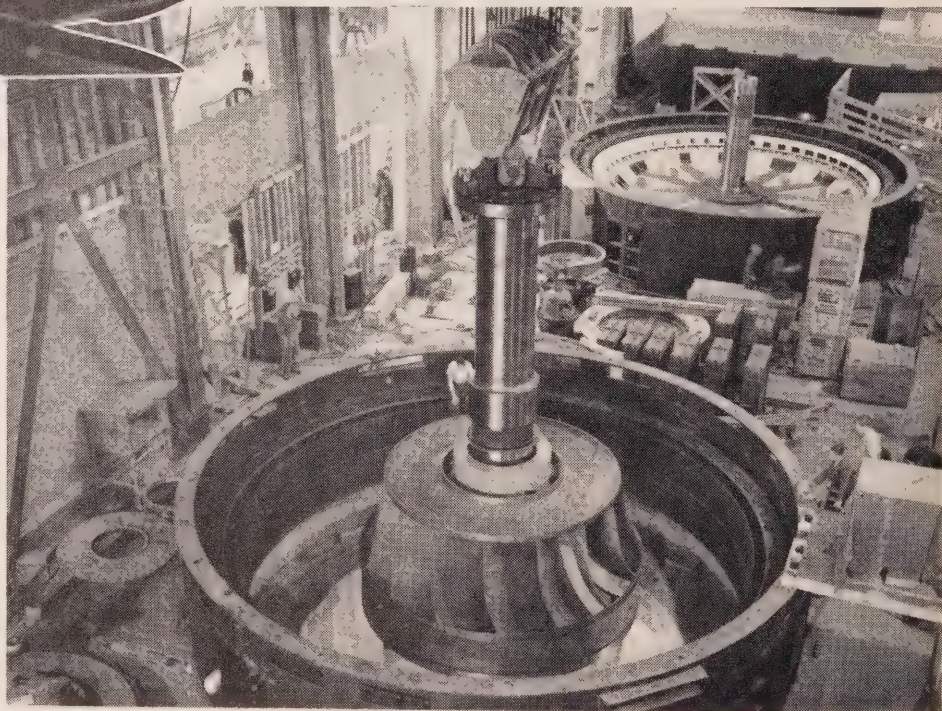
### Types of Penstock Valves

The two types of penstock valve commonly in use are the gate valve and the butterfly valve — which, as their names imply, consist of a sliding disc in the first instance and a rotating disc in the second — to close off the flow of water. Other types of valves, such as the Johnson hydraulically-operated valve, are

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FRANCIS or bucket-type runners, similar to the type shown on the right, are used on turbines at high-head generating stations (over 80 feet) while propeller blade-type runners are used at developments under 80 feet. A more recent development of the propeller type is the adjustable blade or Kaplan runner, above, at Ragged Rapids G.S. on the Muskoka River.

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also available, and each type has its own particular use. While head-gates and valves are also designed by the manufacturer, the hydraulic engineer must prepare the specifications covering this equipment also.

### Discharge of Flood Flows

As previously stated, one of the functions of the dam in a hydro-electric plant is to provide for the discharge of flood flows. This is accomplished by the provision of sluiceways or openings in the dam, the discharge through which is usually controlled by steel sluice gates or wooden stop-logs. Sluice gates are used where the space is restricted, or where quick action is required to handle sudden freshets. As these gates may be required to operate during severe winter conditions, they are usually supplied with electric heaters to keep them free from ice. If stop-log sluices are used, a special type of spud winch is provided to place and remove the logs as required.

Frequently a log slide or chute is a necessary part of a development and sometimes forms an interesting feature of the plant design.

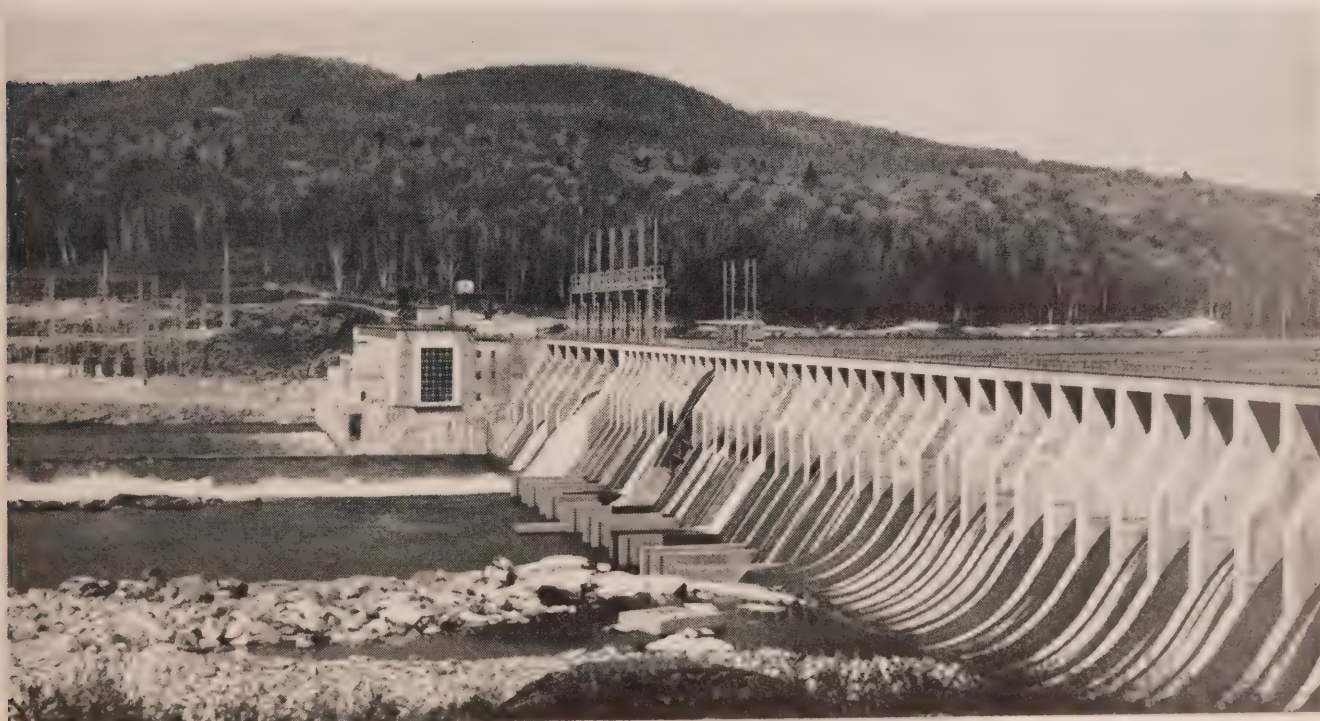
### Preparation of Plans

It is one thing for the engineer to determine the structures and equipment he requires, and another thing to have his ideas put on paper so that his vision of the completed plant may be consummated. This is where the designer and the draftsman fulfil their tasks. The preparation of the plans for a hydro-electric power development requires a considerable amount of creative work on the part of the designer and of skill on the part of the draftsman in producing the necessary plans. The Commission takes pride in the work turned out by its engineers and draftsmen in the past 40 years, during which period 30 plants, with installations totalling about 3,500,000 horsepower, have been designed and built. ■



WHEN plants are located on rivers used for lumber drives, log slides or chutes are a necessary part of the development. This chute is incorporated in the main dam at Hydro's Des Joachims plant on the Ottawa River.

OTTO Holden Generating Station on the Ottawa River was designed with six, motor-operated sluice gates and 42 stop-log sluices to discharge excess water when the river is in flood.





by Frank Wood

# NEW POWER ARTERY



NEW transmission line traverses rugged terrain between Terrace Bay and Marathon near Lake Superior. Here, Cam. Murdie, field engineer, Line Construction Department, and George Ovens, line inspector, Transmission Department, are checking on the line plans.

AT many points it was necessary to haul construction material, equipment and supplies by tractor and sled over temporary winter access roads for distances up to 10 miles.





## Ontario Hydro Builds New Transmission Line Across Rugged Terrain to Serve Residents of Manitouwadge Townsite

**W**ITHIN a few months, residents of Manitouwadge Townsite, a spanking new mining community, some 275 miles east of Port Arthur, will be using the latest in electrical equipment and appliances.

Hydro service for this model community, as well as important base metal mines in the immediate vicinity, will be provided over a new, 115,000-volt transmission line being built by the Commission. This new power artery traverses a rugged stretch of rock and forest along Lake Superior's northern shore between Terrace Bay and Marathon.

Piercing this heavily-wooded area, common to many sections of northern Ontario, has presented many challenges to Ontario Hydro engineers and line construction crews in the past few weeks. As a prelude to actual line construction, considerable tree-clearance work was necessary. In some instances, a helicopter "air-lift" was instituted for transporting the woodsmen. Frequently, one member of the airborne crew was lowered by rope to clear a spot large enough to permit the aircraft to make a landing for a start on tree-cutting operations. Helicopters were used also, on many occasions, to carry Hydro surveyors to their destinations.

Line-building commenced in December, 1954, with the work force reaching a peak of approximately 350 men a few weeks ago. To hasten construction, draftsmen were sent "into the field" to prepare blueprints for the project.

Accommodation for members of the construction staff was provided at five temporary camps along the route as work progressed, while other workers found quarters at Terrace Bay and Marathon, important northern Ontario pulp and paper towns.

With temperatures dipping to 40 below zero at times, rationing of

water for cooking purposes only became imperative in some camps, thus calling a temporary halt to washing and shaving. But the climate wasn't the only obstacle these gallant construction men encountered.

Some 120 miles of access roads were required in the building of the 76-mile transmission line. These access roads often skirted sheer cliffs 600 feet high in some cases, but they were indispensable for such purposes as transporting the 70-foot cedar poles and other materials used in the building of this new electrical link, as well as food supplies and equipment for the camps.

In the rougher sections of the new line route, the use of tractors and booms for hoisting poles was impossible. In coping with such conditions, gin poles plus sheer manpower proved to be the only alternative.

When the new line is completed and in operation, power will be transmitted from Hydro's Aguasabon Generating Station, near Terrace Bay, to Manitouwadge Lake where transformer facilities are being installed at two points to serve the mining properties and the new townsite.

Work on this community, believed to be the first completely-planned development of its kind in North America, is under the direction of the Ontario Department of Planning and Development. Present plans call for the provision of homes and other facilities for approximately 5,000 people on a site extending over some 1,500 acres.

Carved from a wooded wilderness in little more than a year, Manitouwadge will be able to offer its new citizens all the public amenities and services of other Ontario towns of comparable size, such as schools, water, sewers, roads, telephones, and an abundant supply of electricity. ■

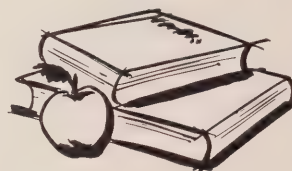


TWO construction crew members prepare to frame a twin-pole structure at a point near Ripple where the line crosses Highway 17.



SETTING up racks for reels before line-stringing starts. These racks permit the reel to revolve as the cable is pulled out.

# CHANGEOVER "SCHOOL"



## TORONTO HYDRO STAFF MEMBERS ATTEND STANDARDIZATION LECTURES

by Allan Jones

SOME 1,500 or more members of the Toronto Hydro-Electric System staff went back to "school" recently.

But they didn't attend the conventional "readin', 'riting', and 'rithmetic" type of classes. Instead they were pupils at a special changeover school for staff representatives of the Toronto System, which is working in co-operation with Ontario Hydro on the five-year frequency standardization program in the city and the adjoining Town of Leaside.

The school was conducted by Ontario Hydro Information Officer D. H. Cook, and consisted of a series of lectures — supplemented by films and slides — outlining the various aspects of frequency standardization in relation to both the overall Southern Ontario pro-

gram and the Toronto project itself.

More than 30 presentations were made—each of approximately 45 minutes' duration—to average groups of 50 Toronto Hydro staff members. Most of the lectures were given at the Toronto Hydro offices at 14 Carlton Street. Several lectures were given also at local system buildings throughout the city, particularly on rainy days when linemen and other outside workers could attend.

### Close Schedule

The decision to hold the changeover information classes for all Toronto Hydro employees, followed an initial presentation to Chairman Bertram Merson and Vice-Chairman John McMechan, as well as to General Manager H. J. MacTavish,

Assistant General Manager and Secretary J. S. McGregor, Director of Consumers' Service W. J. Wylie, and his assistant, Leonard Wells. Special arrangements were made by Mr. Wylie and Mr. Wells, who drew up the closely-knit schedule for the various groups attending the changeover school.

Commenting on the school, Chairman Merson said the lectures and films "were of great value, and will have a far-reaching effect which is bound to prove of benefit to all concerned in the immense task now being undertaken in the area served by our system."

From the beginning of the frequency standardization program in 1949, Ontario Hydro has undertaken to keep local utilities well informed on all phases of the giant





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ONE of the more than 30 groups of Toronto Hydro employees "in class" as Ontario Hydro Information Officer D. H. Cook outlines specific phases of the Queen City's changeover program.

changeover operation, since they not only have a direct interest in the project, but are also the vitally important links between the Commission and the customers on their system affected by the program. More than 116 special tours have been conducted for over 1,000 representatives of local utilities and other municipal officials, for example. Other changeover information services have been regularly provided by the Information Department (Frequency Standardization).

At the same time, the story of the changeover program is being told to customers themselves in the various municipalities, through speech and film presentations to service clubs, church and school groups, and other organizations. ■

STAFF members were advised that changeover information could be obtained by calling the telephone number indicated on the lower display card shown in this photograph. Toronto Hydro representative Leonard Wells, right, listens to Mr. Cook explain Toronto schedules.

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# PROMINENT ENGINEER TO RETIRE

**R**ECOGNIZED as an outstanding engineer with a national reputation, J. Clark Keith, General Manager of the Windsor Utilities Commission will retire on July 1 this year at his own request. Mr. Keith will be retained in a consultant capacity, being succeeded by another well-known engineer, J. E. Teckoe, Jr., Assistant General Manager.

Mr. Keith, who was born at Smiths Falls, Ontario, leaves his present position with many tangible tributes to his engineering and administrative abilities. The first is, of course, the thriving Windsor Utilities Commission, which he has administered for 20 years.

The second is Canada's second largest fuel-electric generating station at Windsor named in his honor by Ontario Hydro. To Mr. Keith fell the privilege of officially placing this station in service in 1951.

The distinguished engineer received his primary and secondary education at Smiths Falls. In 1906, the opportunity offered itself to join a survey party on location of the then Grand Trunk Pacific Railway east of Lake Nipigon where he spent a year. In the Fall of 1907 he enrolled in the Faculty of Applied Science in the University of Toronto from which he graduated with honors in 1911.

In the summers between college sessions he was associated with the Hydrometric Branch of the Department of the Interior on stream discharge measurements in Western Canada. In 1912 he joined the staff of the City of Moose Jaw, Sask., where he remained until 1920. In that year he associated himself with the staff of Morris Knowles Ltd. at Windsor as Deputy Chief Engineer to Mr. Knowles who was



J. E. TECKOE, Jr., present Assistant General Manager, Windsor Utilities Commission, will succeed J. Clark Keith, right, when he retires as General Manager on July 1 this year. In this photograph, taken in 1950, Mr. Teckoe, left, in his capacity as Immediate Past President of the A.M.E.U., is presenting a silver tray to Mr. Keith, retiring A.M.E.U. President.

Chief Engineer of the Essex Border Utilities Commission and consultant to the Canadian Steel Corporation. In the following year Mr. Keith was appointed Chief Engineer, a position and title he held until 1935.

The Essex Border Utilities Commission had supervisory control of the local board of health and the Metropolitan General Hospital throughout those years. It was also the City Planning Authority. Mr. Keith was identified with hospital work in Windsor from 1922 to 1949. He was a Director of the Ontario Hospital Association for many years and is a Past President of that organization. When the Blue Cross Plan for Hospital Care was inaugurated in 1941 he was Vice-President of the Board of Directors, a position

he retained until his resignation at the end of 1949.

In 1935 he was a member of the Royal Commission appointed to study the problem of amalgamation of the four municipalities of East Windsor, Walkerville, Windsor and Sandwich. When amalgamation became a reality he was named City Controller with executive jurisdiction over all civic departments, directly responsible to a Finance Commission consisting of four members. With amalgamation, all existing water and Hydro commissions were abolished as well as the Essex Border Utilities Commission. The Windsor Utilities Commission was created to replace eight commissions which had previously existed in the

*(Continued on page 25)*



# FOTO-NEWS

**MEMORIAL FUND**—Contributions totalling \$9,607.35 to the Robert Hood Saunders Memorial Fund by Ontario Hydro employees throughout the province were turned over to Fund representatives recently. Participating in special ceremonies in the Commission's Board Room were, left to right: W. B. Bowyer of Hydro's Personnel Branch; W. A. Logie, Chairman, Ontario Hydro Unit No. 1, Canadian Federation of Professional Engineers; W. Ross Strike (rear), Vice-Chairman, Ontario Hydro; Arthur Lascelles, Treasurer of the Fund; John Dibblee, Assistant General Manager - Personnel, Ontario Hydro; W. C. Broad, President, Employees' Association, Ontario Hydro; A. Kingsley Graham, Chairman of the Memorial Fund, and A. W. Manby, General Manager, Ontario Hydro.



**HONORARY MEMBERS** — A total of 151 years' municipal utility service is represented by these four Past Presidents of the Association of Municipal Electrical Utilities. The four were presented with honorary memberships in the A.M.E.U. at the Association's recent sixth annual Past Presidents' dinner in Toronto, bringing to 16 the number of former presidents who have been so honored. Examining one of the framed membership scrolls, from left to right, are: C. A. Walters, Manager and Secretary of the Napanee Public Utilities Commission, who has given 51 years' service in the electrical field; A. B. Manson, who retired last year as General Manager of the Stratford Public Utilities Commission after 44 years' service at Stratford; W. R. Catton, a 45-year veteran in the electrical field, and now Manager of the Brantford Public Utilities Commission, and T. W. Brackenreid, former Manager of the Port Arthur Public Utilities Commission, who served with this commission from 1924 to 1935, when he retired to enter private business.



# HE PRACTISES AT PRESTON

ABRAHAM M. BOWMAN

Still actively participating in Preston P.U.C. operations at 81, he's regarded as one of Canada's oldest practising professional engineers.



**I**N A RECENT edition of his daily column "Around the Town," Earl Werstine of the Galt Daily *Reporter* chose as his subject the career of Abraham M. Bowman, a member of the Preston Public Utilities Commission staff.

Mr. Werstine's article read as follows:

"Today it's our pleasure and privilege to introduce to you one of the oldest practising electrical and civil engineers in the country, Abraham M. Bowman, of the Preston Public Utilities Commission staff. He has been located in Preston for four years or more and lives at 1631 Queen St.

"Abraham Bowman comes from Mennonite stock. He was born in the Township of Woolwich, North Waterloo, in 1874, the son of Levi B. Bowman, a descendant of one of the original pioneers of this county, Henry Bowman, who came to this district in 1814 from Pennsylvania. He is a modest man, hesitant about discussing himself, but fortunately for us, Ollie Little, Chairman of the Preston P.U.C., was in his office when we called and he gave us a helping hand. Mr. Bowman, we were told by those who know him better, is a genius, an expert with the pencil on the drafting board and a self-made man. I was surprised to learn that he had never gone to college to take up engineering, but gained his knowledge through a correspondence course. In his office hangs a framed registration diploma which indicates he became a member of the Association of Professional Engineers of Ontario, electrical branch, in August, 1938. He is a life member of the American Waterworks Association from which he received in 1939 the coveted Fuller Award 'for outstanding service.' He was engineer at Elmira, in charge of the waterworks and Hydro departments and for 17 years was the manager of the P.U.C. there. Before that he was employed by the town in various capacities.

"Brought up on the farm he spent his early life there and then moved into Waterloo to learn the woodworking business, and that he was adept at it is indicated by the fact from the start of the Mueller's cooperage business, now the Canada Keg and Barrels, he was the plant superintendent, a position he held until going to Elmira.

"Mr. and Mrs. Bowman have one son, Henry B. who lives at home and is employed as plant engineer at the Canadian Office and School Furniture plant in Preston.

"Mr. Bowman Sr., does not look his years, although he is bald. May he live to enjoy many more years, and also thanks to Ollie Little for his great assistance." ■



## ALONG HYDRO LINES



### Bank Collection Service Popular

Banks in Windsor collected 35 percent of the 247,483 Hydro bills issued during 1954 by the Windsor Utilities Commission. The Windsor Commission has, for many years, permitted every bank in the city to collect Hydro and water bills, the cost being paid by the utility. The banks receive 7 cents for each bill under \$15 and 10 cents for those in excess of that amount. The total cost to the Windsor U.C. during 1954 for the bank collection service was \$6,279. According to J. Clark Keith, General Manager, the local commission is the only utility in the city to extend this service to its customers cost free. Mr. Keith said the plan has met with public approval since its inception. Furthermore, the Hydro division collected water bills totalling \$157,950, while the Water division collected \$29,428 in Hydro bills. Each division pays the other 5 cents per bill for this service.



## Correspondents Receive Awards

Presentation of Ontario Hydro certificates and awards for outstanding rural newspaper reporting were made by James A. Blay, Director, Information Division, Ontario Hydro, at the annual convention of the Ontario Weekly Newspaper Association in Ottawa recently. Recipient of the Award of Merit was Miss Lucy R. Woods, seated, Bayfield correspondent of the Clinton News-Record. Certificates of Merit were presented by Mr. Blay to Miss Marjorie McArthur, left, Highgate correspondent of the Dominion Press, Ridgetown; and Mrs. M. Johnston, King City correspondent for the Aurora Banner, whose award was accepted by Mrs. Dorothy Barker, Women's Editor, Aurora Banner. The Hydro awards were established last year for the first time in acknowledgement of the influential role played by the rural press in portraying the progress and achievements of Ontario's farm and hamlet population.

### Four Employees Retire at Galt

Four employees of the Galt Public Utilities Commission, who have given service in excess of 125 years to the people of the community, were guests of honor at a recent retirement banquet.

The employees, some who commenced their employment with the local commission in its infancy were John F. Elliott, 41 years' service; Charles Cuthiell, 33 years; Roy G. Cherry, 33 years, and Robert Clark, 18 years.

Commission Chairman E. V. Brown, in presenting the veteran employees with suitable recognition of their services, noted that they had played a considerable part in the growth of the community and commission operations. When Mr. Elliott began work on a part-time basis in 1910, the Galt Commission had a demand of approximately 2,000 horsepower for 2,400 customers. In 1954 this was 25,000 hp. used by some 7,300 customers. Plant values in this period increased from \$200,000 to over \$2,000,000.

## VOICES CONFIDENCE IN FUTURE OF NUCLEAR-ELECTRIC POWER

**S**PEAKING at the recent annual banquet of the Rubber Association of Canada, Dr. Richard L. Hearn, Chairman of Ontario Hydro, expressed confidence that engineers and physicists of Canada, Great Britain and United States would, within the next five to eight years, find the road to development of nuclear-electric power at costs competitive with other fuels.

Pointing out that the St. Lawrence Power Project is the last remaining major source of power in Ontario within economical transmission distance of large load centres, the Hydro Chairman said that the Commission must continue to look ahead to fresh sources if it is to meet expected demands.

"We estimate," he said, "that power from the St. Lawrence development will have been used up by 1961 or 1962. We feel, therefore, that we must look forward now to our next source."

Dr. Hearn noted that Ontario was in the "very fortunate" position of having large deposits of uranium — a basic ingredient in the operation of nuclear reactors — while it does not have large natural deposits of other fuels, such as coal, oil, or natural gas. Dr. Hearn took the opportunity, however, of making clear his contention that nuclear power



DR. HEARN, left, during his address to the Rubber Association of Canada with R. C. Berkinshaw, Immediate Past President, seated.

would, in the future, supplement Ontario Hydro's present resources, but would not displace them.

To an interested audience of more than 225 association members, the Hydro Chairman outlined other aspects of the search for new power sources, as well as the current work the Commission is doing in connection with the vast St. Lawrence Power Project.

Of particular interest to the association, he said, is the fact that nearly all construction equipment at the St. Lawrence Project will be moving on rubber.

"Much of the equipment used just over 30 years ago during the construction of the Sir Adam Beck No. 1 Generating Station at Niagara, moved on rails," he said. "At our new Sir Adam Beck No. 2 development, on the other hand, there was not a quarter of a mile of railroad, and power shovels, tractors, and other mobile equipment had rubber tires. We had a fleet of 90 trucks, all on rubber. It will be the same thing at the St. Lawrence Project."

To conclude his talk, Dr. Hearn showed the Ontario Hydro film "The Powerful Horeshoe," which tells in dramatic color the story of the initial stages in the building of the Sir Adam Beck No. 2 station at Niagara.

The speaker was introduced to the gathering by R. C. Berkinshaw, Immediate Past President of the Rubber Association. Mr. Berkinshaw, who is President and General Manager of Goodyear Tire and Rubber Co. of Canada Ltd., is a former President of Polymer Corporation, the synthetic rubber plant at Sarnia built under Dr. Hearn's direction, as chief construction engineer, while on loan from the Commission during the Second World War.

I. G. Needles, Vice-President of the association, and President of B. F. Goodrich Rubber Co. of Canada, expressed the thanks of association members to the Hydro Chairman. ■

### Negotiate Agreements For Belted Fans

Agreements concerning the manufacture and sale of dual frequency motors for belted fans, which will result in a material saving in frequency changeover costs, have been approved by Ontario Hydro. The manufacturers concerned are Leland Electric Canada Limited and the Canadian General Electric Company Limited.

When the electrical supply powering dual frequency belted fan units, is changed from 25 to 60 cycles, only a slight adjustment is needed to make them operable at the higher frequency. These agreements will supplement others which Hydro previously effected with various manufacturers concerning dual frequency refrigerators, clothes dryer motors, oil burners, sump pumps, fluorescent light ballasts, and industrial motors and transformers.

### New Headquarters For Northeastern Region

Ontario Hydro has awarded a contract for the construction of a new office building for its Northeastern Region headquarters. The office will be a two-storey brick and steel structure with full basement, 147 feet long and 50 feet wide, with a wing at the rear, 64 feet long and 48 feet wide.



## A PLUG FOR SAFETY

**I**MPORTANT changes in regulations designed to promote greater electrical safety in the home have been announced by the Canadian Standards Association and Ontario Hydro.

The Canadian Standards Association has ruled that, as of September 1, 1955, portable electrical equipment installed in locations which may be termed hazardous by reason of the proximity of electrical equipment installed therein to sinks, water and air-conditioning pipes, etc., must be grounded and provided with a three-prong attachment plug-cap.

In view of this ruling it is expected that an increasing number of appliances will appear on the market equipped with three-conductor cords and plugs. In order that householders will not be unduly inconvenienced by this ruling, Ontario Hydro has amended its wiring regulations by requiring that, effective June 1, 1955, all new or



THREE-PRONG attachment plug-cap, left, and new, three-conductor receptacle, right.

rewired homes and residential buildings be equipped with one three-conductor receptacle in each area used as a kitchen, laundry room, breakfast room or utility room. This same type of grounded receptacle must be installed in all locations in the basement unless the floor, walls and ceiling are of insulating material. ■

## Important Station Reaches Completion

Ontario Hydro's \$500,000 switching station in McIntyre Township, near Port Arthur, is now completed and in service.

The station will serve to "tie-in" circuits to the Lakehead Cities of Port Arthur and Fort William, the Great Lakes Paper Co., and Steep Rock and Caland Iron Mines at Steep Rock Lake with Hydro's Nipigon River generating stations.

Also completed is a new transmission line from the new station to serve Caland at Steep Rock. Power from the switching station can be transmitted in any desired direction by semi-automatic and remote control facilities from an existing terminal station at Bare Point in Port Arthur. Ultimately the switching station will be equipped to become a transformer station, boosting the supply of power to the two Lakehead cities, D. I. Nattress, Manager of the Commission's Northwestern Region stated.

## NEW VICE-CHAIRMAN AND COMMISSIONER APPOINTED

*(Continued from page 1)*

ness life of Owen Sound for several years.

First appointed President of the Ontario Municipal Electric Association in 1953, Lt.-Col. Kennedy was re-elected to this important office in March this year for a second term. The new Commissioner's interest in Hydro affairs stems from a lengthy association with the Owen Sound Public Utilities Commission of which he has been a member for the past decade. He was named Chairman in 1947 and has served continuously in that capacity since that time.

Lt.-Col. Kennedy's affiliation with the O.M.E.A. has included election to several important executive posts prior to assuming the presidency in 1953. At the same time he has been

actively identified with the Georgian Bay District of the O.M.E.A., now serving his second term as First Vice-President.

Born and educated at Owen Sound, he served with distinction in England, Italy and northwest Europe, commanding the Hastings and Prince Edward Regiment during World War II. He was awarded the Distinguished Service Order for gallantry in action and also has received the Canadian Efficiency Decoration for a long period of outstanding military service. Lt.-Col. Kennedy has been Commanding Officer for the 45th Anti-Tank Regiment at Owen Sound since the end of the war. Lt.-Col. and Mrs. Kennedy have one son and three daughters. ■

## C.S.A. Issues Electrical List

The fifth edition of the List of Electrical Equipment approved by the Canadian Standards Association has been announced and distribution is now underway. This book of over 1,000 pages, arranged alphabetically, both as to subjects and manufacturers' names, gives a detailed description of the electrical equipment, apparatus and supplies listed on the approval records of the Canadian Standards Association up to August 31, 1954. This comprehensive book, together with Supplements, which are issued every four months, will cover equipment approved up to May 31, 1956. The fifth edition contains approximately 55,000 listings and are 5,000 in excess of the fourth edition issued in 1953. It may be obtained without charge by directing your request on an official letterhead to the CSA Approvals Laboratories, P.O. Box 506, Weston, Toronto 15.

### **E. W. McLeod Named Electric Club President**

E. W. McLeod, Chief Electrical Inspector, Consumer Service Division, Ontario Hydro, has been elected President of the Electric Club of Toronto. Another Hydro representative, J. R. Montague, Director, Engineering Division, was named a member of the Club's new Executive Committee. Mr. Montague is also the 1955 President of the Association of Professional Engineers of Ontario.

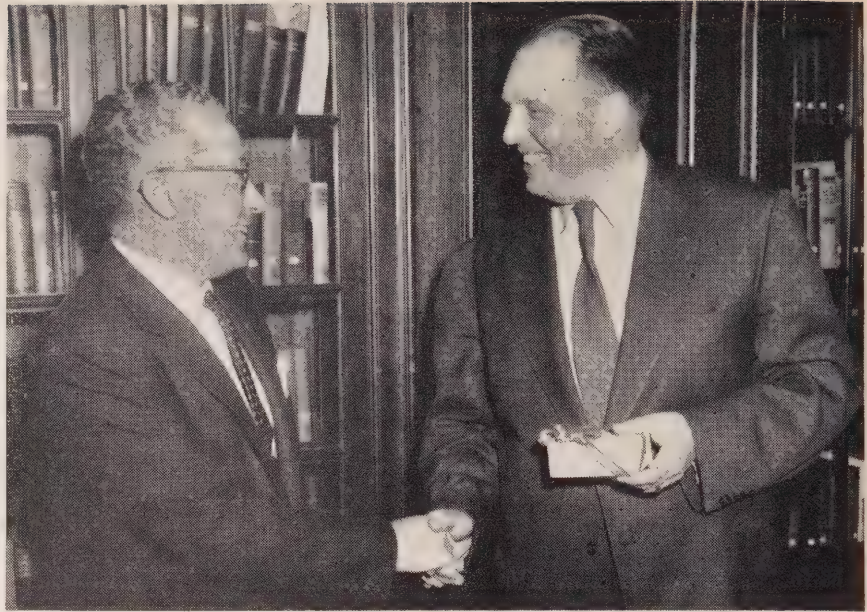
Mr. McLeod, who joined the Commission in 1919, has been an active member of the Electric Club of Toronto since 1925. He was Assistant Approvals Engineer in Hydro's Research Laboratory until his appointment in 1945 as Assistant Chief Electrical Inspector. Two years later he became Chief Electrical Inspector.

Founded in 1916, the Electric Club of Toronto provides an opportunity for those in the electrical industry to get together at weekly luncheon gatherings to hear speakers on topics of general interest.

### **NIAGARA'S SAFETY RECORD**

Combined efforts of supervisors, foremen and staff have been credited with earning Ontario Hydro's Niagara Region the distinction of having the best safety record of the Commission's nine regions during 1954.

Announcing this recently, Manager A. S. Robertson said three of the rural operating areas in the Niagara Region established accident-free records for the year. With a total of 63,741.3 man-hours of work in 1954, Beamsville R.O.A. was free of accidents for the second year in succession. Similarly, Dunnville R.O.A. established a perfect record for the second consecutive year with a total of 24,378.7 man-hours of work. The third area—Welland R.O.A.—had no accidents in 1954 with a work total of 108,801.1 man-hours.



### **HONOR A.M.E.U. SECRETARY-TREASURER**

In recognition of his services as Secretary-Treasurer of the Association of Municipal Electrical Utilities, members of the Association recently presented a gold wrist watch to W. R. Mathieson (right). Making the presentation at the sixth annual Past President's dinner in Toronto, J. E. Teckoe, Jr., Assistant General Manager, Windsor Utilities Commission (see page 18), and a Past President of the Association, said the Secretary has "served the A.M.E.U. in a magnificent manner. Our progress can, in large part, be attributed to him." Mr. Mathieson, also a member of the staff of Ontario Hydro, has held the position since September, 1947.

### **Galt Utility Increases Deposits**

Galt P.U.C. has increased Hydro and water domestic deposits from \$5 to \$10 for new tenant customers. The utility also ruled that commercial and power customers make a deposit on application for service, and that deposits now held be increased to a sum approximating one month's account. Interest will not be paid on deposits held.

It was reported that the \$5 had borne "no actual relation to anything," having been put into effect when customers' accounts were much smaller. Commissioner H. O. Hawke said the system of Hydro deposits is now being studied by a special committee of the O.M.E.A.

### **Almonte P.U.C. Official Dies in 78th Year**

William G. Kelly, Secretary-Treasurer of the Almonte P.U.C. for 21 years, died recently in his 78th year. A great lover of sport, Mr. Kelly excelled at curling, and was the skip of the winning rink that went to Quebec City twice in succession to compete in the Royal Caledonian bonspiel. Surviving are Mrs. Kelly and a son, Richard, of Perth, Ontario.

Members of the Almonte Commission—Dr. A. A. Metcalfe, Mayor McDonald, and O. A. McPhail, Robert Houston and James Edmonds, and two members of the staff, Edward James and Frank Honeyborne, were honorary pallbearers.





GROUP, left to right: Harry I. Price, Chairman, C.N.E. Sports Committee; Donald Ross, C.O.T.P. Chairman; Legion President George F. Long, and Chairman E. N. Hallman, Legion Fund-Raising Committee, shown during the presentation of an initial cheque for \$2,500 from Ontario Hydro Legion Branch No. 277 in aid of the 1955 Canadian Olympic Training Plan.

## AMBITIOUS PROJECT

ONTARIO HYDRO Branch No. 277 of the Canadian Legion has announced its intention of participating in one of the most ambitious projects of its comparatively long history. Starting in 1956 it will attempt to sponsor the Canadian Olympic Training Plan.

The "COTP" is a unique scheme initiated by the late Robert H. Saunders, former Chairman of Ontario Hydro, while he was Chairman of the Canadian National Exhibition Sports Committee, as a means of training future Canadian Olympic athletes. The plan brings Olympic hopefuls from all parts of Canada during the Canadian National Exhibition's two-week run, where entrants and coaches can compete in trial events and receive special training.

The Ontario Hydro Branch will attempt to sponsor the plan by turning over the proceeds from its 4th Annual Legion Day to be held this year, August 20, at Varsity Stadium. Legion Day is a yearly sports extravaganza offering top sports attractions, pre-game enter-

tainment by the Navy, Army and R.C.A.F. bands and other specialized military outfits, plus a long list of free prizes for seat holders.

During the past three years, Ontario Hydro Branch No. 277 has donated equipment, valued at \$40,000 to hospitalized veterans across Canada as well as to indigent families of veterans. This year they hope to broaden the service program of the branch by including the COTP.

To match deeds with words, Branch President George Long already has presented \$2,500 toward the \$20,000 needed for this year's plan. To meet the yearly request for aid made by the COTP, the Ontario Hydro Branch is stepping up its fund-raising efforts this year.

"We hope that other Legion branches across Canada will join with us to support the Canadian Olympic Training Plan," states President Long. "We feel it is the Canadian Legion's duty to enhance the international prestige of Canada, while at the same time, improving, wherever possible, the physical fitness of Canadian youth."

## PROMINENT ENGINEER TO RETIRE

*(Continued from page 18)*

four municipalities. Mr. Keith was appointed its General Manager.

He was a member of Council of the Association of Professional Engineers for 20 years and is a Past President. He is also Past President of the Canadian Section of the American Waterworks Association and of the Association of Municipal Electrical Utilities. He is a former Vice-President of the Engineering Institute of Canada. He has received the George W. Fuller Award from the American Waterworks Association for service in the water supply field.

Mr. Keith is a Presbyterian, is married, has two children, Mrs. Chas. B. McLean, Toronto, and Dr. W. Elliott Keith, of Windsor, and has five grandchildren. He has been a member of the Windsor Rotary Club for 34 years and was Treasurer for 15 years. He is a life member of Rose Lodge, A.F.&A.M. For diversion he likes the out-of-doors, growing flowers, and fishing.

Succeeding Mr. Keith, J. E. Teckoe, Jr., has had a long and varied association with Hydro. His father, J. E. Teckoe, was Manager of Niagara Falls Hydro-Electric Commission for many years. Windsor's new General Manager started his Hydro career with the Niagara Falls Commission in 1923 serving until 1939 in various capacities. For five years he was Superintendent of Tillsonburg P.U.C., becoming General Manager of Galt P.U.C. in 1944. He relinquished this position in 1951 to become Assistant General Manager at Windsor, a position he has held since that time.

Active in engineering circles he is also a Past President of the A.M.E.U., and a member of the Association of Professional Engineers of Ontario. Married. Mr. Teckoe has two children. ■



Not the Atlantic sweeps a flood  
Potent as the ploughman's blood.  
He, his horse, his ploughshare, these  
Are the only verities.

LOUIS GOLDING, "Ploughman at the Plough."

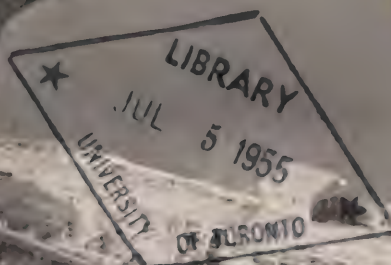




ONTARIO HYDRO

# *News*

JUNE, 1955



MANITOU MARCHES ON



# ONTARIO HYDRO

## News

June, 1955

Vol. 42

No. 6

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## FAVORABLE POSITION

**V**IVIDLY demonstrating the undiminished tempo of power demands in Ontario today, the Commission's recently-issued annual "digest" of information entitled: "Ontario Hydro—Nineteen Hundred and Fifty-Four," records many significant achievements last year in satisfying these seemingly insatiable electrical requirements.

This profusely-illustrated brochure, which already has reached an audience of some 5,000 or more persons, directs attention to the striking fact that the Commission, at the close of last year, was in "the most favorable position for many years from a power supply standpoint." The dependable peak capacity of the Commission's resources reached 4,135,050 kilowatts by the end of 1954, "thus providing, for the first time in many years, a reasonable margin of reserve for the systems." It is worthy of note that the dependable peak capacity of Hydro's resources was 16 percent greater than the 1953 capacity, while total energy production for commercial load purposes totalled 22,386,456,876 kilowatthours during the year, representing an increase in net output from all sources of seven percent over the 1953 figure.

While favorable water conditions "contributed to the success of the year's operations," the completion of seven units at the new Sir Adam Beck-Niagara Generating Station No. 2 and the installation of two further units at the Pine Portage plant on the Nipigon River were among the factors responsible for the marked improvement in the power supply situation.

Another vital phase of the Commission's expansion program last year was the construction of additional transmission and distribution facilities. In 1954, a net addition of 534 circuit miles of transmission line was made, bringing the total to 15,785 circuit miles. Rural distribution lineage was increased by the net addition of 951 miles, reaching a total 42,540 miles at the end of December. This ranks as an accomplishment of considerable importance in view of the fact that Ontario Hydro last year was delivering power to municipal distribution systems serving 375 municipalities, in addition to 188 direct industrial customers, and also to its 105 rural operating areas. Worthy of mention also is the fact that a total of 1,467,034 ultimate customers was being served over the combined facilities of the Commission and the associated municipal systems, this total constituting an increase of 5.6 percent over the total at the end of 1953.

This concise yet comprehensive review of Commission operations for the year 1954 will serve as a valuable reference manual for newspaper and business paper editors, municipal Hydro representatives, members of the Ontario Hydro staff, Ontario and Canadian Government officials, representatives of radio and television stations, librarians and educational authorities, trade, commercial and financial organizations, as well as numerous other individuals and groups, in assessing the profound impact of electricity on the sound and healthy economy of this province.



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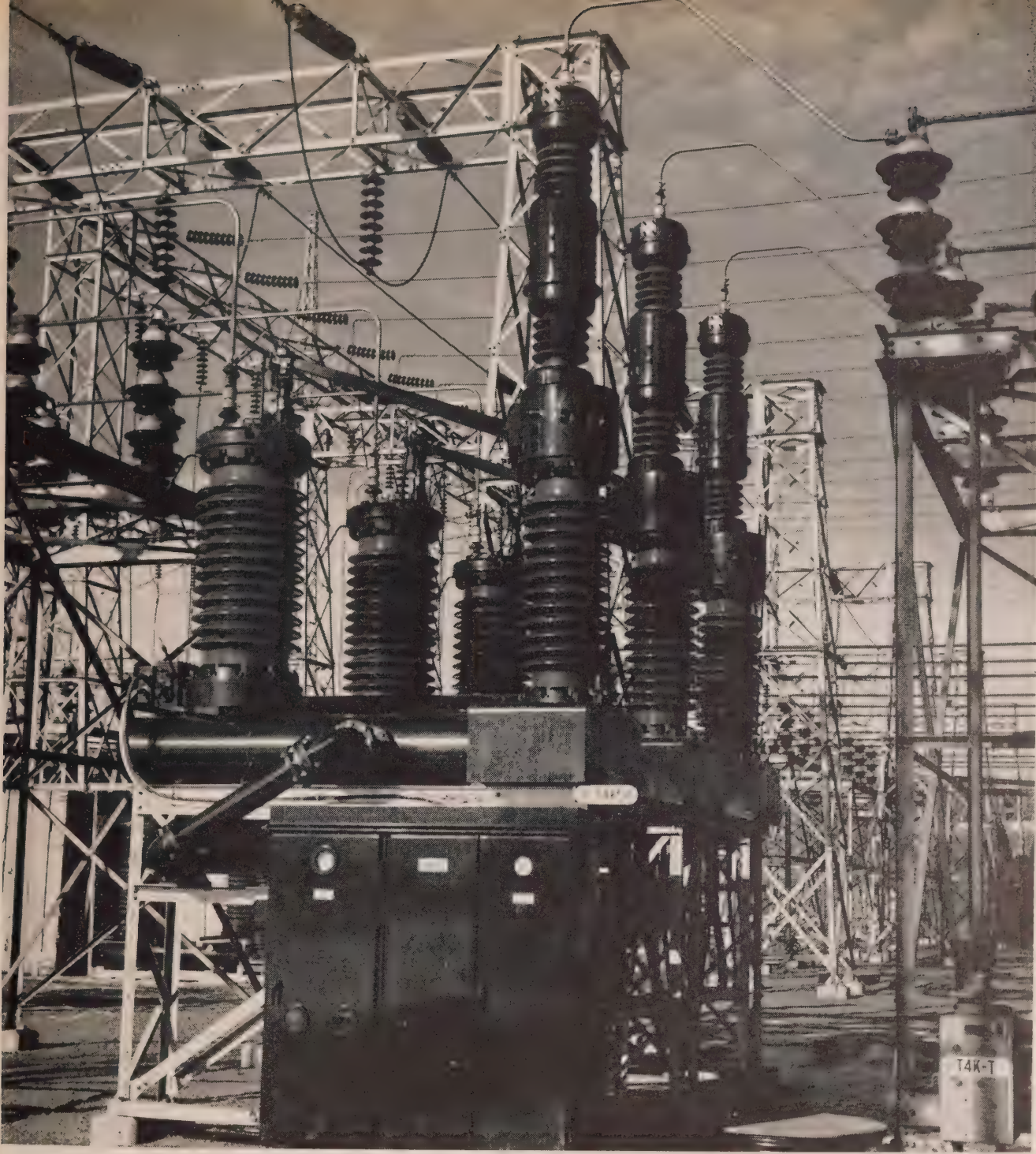
### COVER PHOTOS

**A**LMOST a year ago we published an article "Marching On Manitou," showing the preliminary stages of construction at Hydro's Manitou Falls project on the English River in northwestern Ontario. This month our front cover presents an aerial conception of the amazing progress of this project up to the middle of May this year.

Our back cover photograph shows Raleigh Falls, a picturesque and favorite stopping-place for motorists along Highway 17 between Fort William and Dryden.

Material published in Ontario Hydro News may be reprinted without permission. Most photographs are obtainable on request. If required, stereos will be provided.





## **NEW CIRCUIT BREAKERS**

**D**ECIDEDLY photogenic are the 12 new air blast circuit breakers, one of which is shown above, being installed at Hydro's Burlington Transformer Station, near Hamilton, for automatic switching and control of 115,000-volt circuits. High voltage air blast circuit breakers are a comparatively recent development. The Commission has three installations at present, the first having been made at St. Clair Transformer Station, Sarnia. As indicated by the name, arc extinction is achieved by a blast of high pressure air.



# NPD—Canada's First

**Ontario Hydro's Des Joachims property on the Ottawa River to be the site of initial nuclear-electric project**

CANADA'S first nuclear-electric generating station, to be known as NPD—Nuclear Power Demonstration—will be built on Hydro property in the vicinity of the Commission's Des Joachims Generating Station on the Ottawa River.

Making this announcement on June 3, Commission Chairman Dr. Richard L. Hearn said that this initial plant will produce up to 20,000 kilowatts. It has been estimated that it will cost between \$13,000,000 and \$15,000,000.

Outlining the reasons for selecting the Des Joachims area as the site for the important installation, Dr. Hearn stressed the fact that the Commission owns considerable property in that district suitable for the location

of such a plant. In addition, its proximity to the Crown-owned Chalk River plant of Atomic Energy of Canada Ltd., where initial studies of the feasibility of the project have been underway for the past year or more, was another significant factor.

## Joint Project

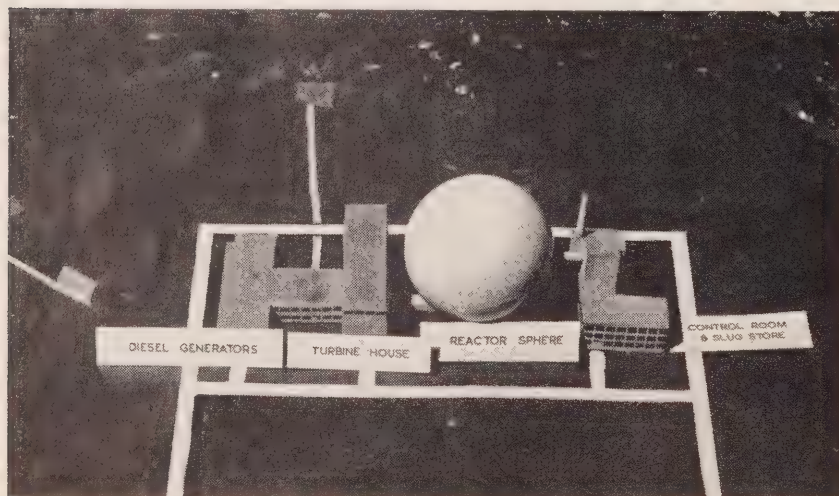
The plant, to be built jointly by Ontario Hydro, Atomic Energy of Canada Ltd., and the Canadian General Electric Co. Ltd., is scheduled for operation in 1958. When in service, its output will be fed into the Commission's Southern Ontario System, providing a practical means of studying its operation in conjunction with other sources of power.

At the same time engineers will continue research and development work on still newer techniques in the nuclear field with the eventual goal of generating electric power from this source at a cost competitive with the cost of power generated from other fuels.

Looking to the future, a plentiful supply of uranium—the basic fuel in the operation of nuclear reactors—is available within Ontario, in contrast with gas, oil or coal, the conventional fuels employed in thermal generation, all of which must be imported.

## Intensive Study

The decision to proceed with the actual construction of the nation's first nuclear-electric plant follows several months of intensive study and investigation at the Chalk River plant of Atomic Energy of Canada Ltd. In November, 1953, Ontario Hydro announced that it would participate in feasibility studies at Chalk River. Since that time an



(United Kingdom Information Office)

△ PLANS were revealed recently for a second British nuclear-electric station at Dounreay in northern Scotland. Dominant feature of the station, a section of which is shown in the scale model above, is the ball-like steel reactor which will be 150 feet in diameter. Steam will be produced inside for generating electricity. Called a "breeder" reactor, it will produce more "fuel" than it consumes.



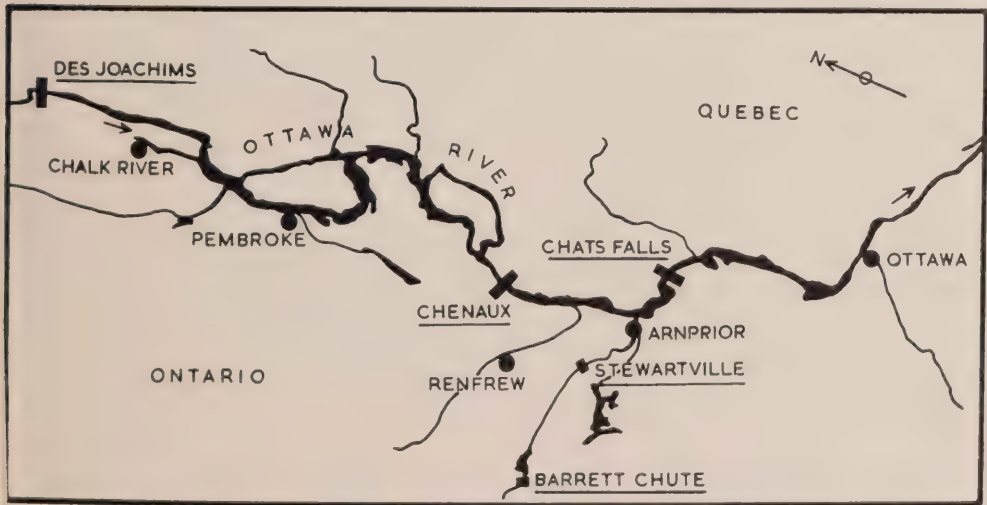
11-man team of research engineers, including three Hydro engineers, headed by Harold A. Smith, now Ontario Hydro's Director, Nuclear Power Project (see page 23), has been engaged in the study of the best methods of producing power from nuclear sources and the preliminary designs for a "pilot" nuclear-electric plant.

### Peacetime Applications

Dr. Hearn, as a Director of Atomic Energy of Canada Ltd., has played a prominent role in Canada's investigations of the peacetime application of nuclear energy, particularly in the field of power generation. In company with Dr. W. B. Lewis, Vice-President in charge of research and development for Atomic Energy of Canada, he has been largely responsible for promoting the purely Canadian study of nuclear-electric resources, and also of Canada's participation in international studies, particularly in Great Britain and United States. With Mr. Smith, he represents Ontario Hydro on Atomic Industrial Forum Inc., a U.S. organization composed of representatives of industrial, educational, labor and financial agencies, which has been formed to study the development and application of nuclear energy to civilian purposes. ■



△ CANADA'S first nuclear-electric station will be built on Hydro property acquired during the construction of the Commission's 509,000-horsepower Des Joachims Generating Station.



△ OUTPUT of the new nuclear power demonstration station, located in close proximity to several Commission hydro-electric plants (names are underlined) in Eastern Ontario, will be fed into the Southern Ontario System.

# SCOUT SALUTE

Hydro's Famed Floral Clock Design Honors World Jamboree

by ALLAN JONES

**B**oy scouts from the four corners of the world will view Ontario Hydro's major power developments at Niagara this summer as part of the activities planned for the eighth World Scout Jamboree to be held at Niagara-on-the-Lake, August 18-28.

An estimated 10,000 Scouts, from points as far distant as Ceylon and Egypt, as well as Australia and New Zealand, will see such massive Hydro projects as the giant new Sir Adam Beck-Niagara Generating Station No. 2, and its companion development, the older Sir Adam Beck No. 1 plant, as well as the remedial and preservation program now underway above the Horseshoe Falls.

Another point of interest for the youthful visitors will be Hydro's famous floral clock at Queenston. In honor of the World Brotherhood of Scouts, which is meeting on North American soil for the first time in the history of the Jamboree, the clock's summer face this year incorporates a special motif, featuring twin floral replicas of the Scout emblem — the fleur-de-lis — and a floral map of the world.

Some 15,000 carpet plants — i.e. plants whose foliage, rather than the blooms, provides the necessary contrasting colors — have been used to create this floral salute to the Scouts. The fleur-de-lis emblems — one on each side of the big circular design — are made up of yellow alternanthera, edged with grey santolina incana and set in a dominant background of red alternanthera. The map at the base of the design consists of sagina moss depicting all

countries of the world except Canada, which stands out in red alternanthera.

The words **ONTARIO HYDRO** circle the outer edge of the design in grey santolina and red alternanthera. Finally, to provide a further contrast to the predominantly red and yellow clock face, a number of blue echeveria glanca plants are dotted around the circumference of the attractive design.

This year, as in the past, thousands of other visitors are expected to visit the unique clock, which was designed and constructed in 1950 by the Niagara Regional staff of Ontario Hydro. A floral clock in Edinburgh, Scotland, was the source of inspiration for the Hydro outdoor timepiece, although the latter is more than three times as large as its Scottish counterpart.

Behind the clock stands a stone tower containing four speakers to



REPLICA of the design for the 1955 summer face (above) of Hydro's world-famous floral clock (right) which will incorporate a special Scout motif. The clock is located near Queenston, a few miles from the site of the World Jamboree.







FEATURE of this year's Jamboree will be these trading sessions among Canadian Scouts and those from 50 other nations. Turbans of these Indian Scouts are coveted trade items.

amplify the Westminster chimes which ring at fifteen-minute intervals. An artwork illustration of the 1955 clock design, marked to show the type of plants used for the various sections of the clock face, hangs inside this tower. Gardeners working in the area are often asked about the plants, and they can direct curious visitors to the illustration in the tower for more complete answers.

Last year's geometric design, brilliantly executed in floral color, drew a host of admiring visitors. Attesting to the ever-increasing popularity of the Hydro clock was the fact that last year's collection of pennies and other coins tossed into the ornamental pool at the base of the clock exceeded the previous year's collection. This has become a popular custom, and Hydro makes very good use of the proceeds — they are donated to the Greater Niagara Community Chest.

Scouts visiting the clock this sum-

mer will not have far to travel from the Jamboree site at Niagara-on-the-Lake. The 4,000-odd Canadian Scouts and representatives of some 50 world scouting organizations will live in a temporary tent-town near historic old Fort George, a few miles north of Queenston.

Over a square mile of land will be dotted with Scout tents, while more than 200 directional signs — using, wherever possible, suitable symbols, similar to those found on European road signs — will be set up to guide the Scouts and visitors about the big camp. A Jamboree arena, where the Scouts will display many of their crafts and skills, will include seating accommodation for some 10,000 visitors.

A substantial supply of food will be needed daily at the camp, dwarfing even Ontario Hydro's daily requirements at Niagara, when

the labor force working on the giant Sir Adam Beck G.S. No. 2 project was at its peak. In the two-week Jamboree period, for instance, more than 400 tons of supplies will be used to provide a quarter of a million meals. The Scouts will eat some four tons of fish; about 17 tons of meat and meat products, and close to 50 tons of fresh vegetables. While Hydro's construction workers had their food prepared for them by competent chefs, the Scouts will cook their own, using about 50 tons of charcoal in the process.

The Scouts will not "rough it" in every respect. Arrangements are being made with the Niagara-on-the-Lake Hydro-Electric Commission, for instance, to provide electric lighting in all headquarters areas, thus adding a modern touch of comfort and convenience to a traditionally rugged way of life. ■



# PATHWAYS

(Chapter IV)

## ELECTRICAL DESIGN OF A HYDRO-ELECTRIC GENERATING STATION

**P**REVIOUS CHAPTERS have described the various hydraulic studies and designs for harnessing the potential energy available at a given hydro-electric power site to the point where it represents mechanical energy delivered at the coupling of the hydraulic turbine units.

It will be the purpose of this chapter to describe the planning and designing of the electrical arrangement whereby the mechanical output of the turbine is converted into electrical energy and delivered into the electrical system.

The principal electrical equipment required may be grouped under the following headings:

**Electric generators** — coupled directly to the hydraulic turbines — in which the mechanical output of the turbines is converted into electric power.

**Transformers** — in which the voltage at which electric power is generated in the electric generators is increased to a higher voltage to meet the requirements of power transmission from the development to the receiving stations.

**Circuit breakers** — inserted at strategic locations in the various electric circuits so that the circuits can be opened or closed as required to control the flow of electric power.

**Relays** — automatic devices by which circuit breakers and other control equipment can be actuated as required for protection and efficient operation of the plant under various conditions. (One particular function of relays is to open automatically the circuit breakers when electrical faults occur in equipment and circuits).

**Switchboards** — on which are assembled the various electrical indicating instruments, relays and control devices required for the operation of the plant.

**Connecting busses and cables** — which include the busses and cables required for the main power circuits and the control cables necessary to interconnect relays, instruments, batteries, motor-starters and associated equipment required for the control, operation and protection of the plant.

Although the design of the substructure and superstructure is primarily the responsibility of the civil engineers and architects, the electrical engineers must prescribe their requirements for the foundations of the generators; the allocation of space for the electrical equipment, busses and cables; the capacity of the powerhouse crane, (governed by the weight of the rotor of the generator); the height of the crane, (determined by the clearance required for lifting the generator-rotor and moving past adjacent units, and by the clearance required for lifting the core of a transformer out of its tank); the floor area re-





# TO POWER

by G. F. Simson, B.Sc.

GENERATOR room of Hydro's Des Joachims Generating Station. Each of the plant's eight units, following the modern trend, is enclosed in a steel housing to improve the appearance, to minimize cleaning, and to reduce noise and temperature levels. ▷

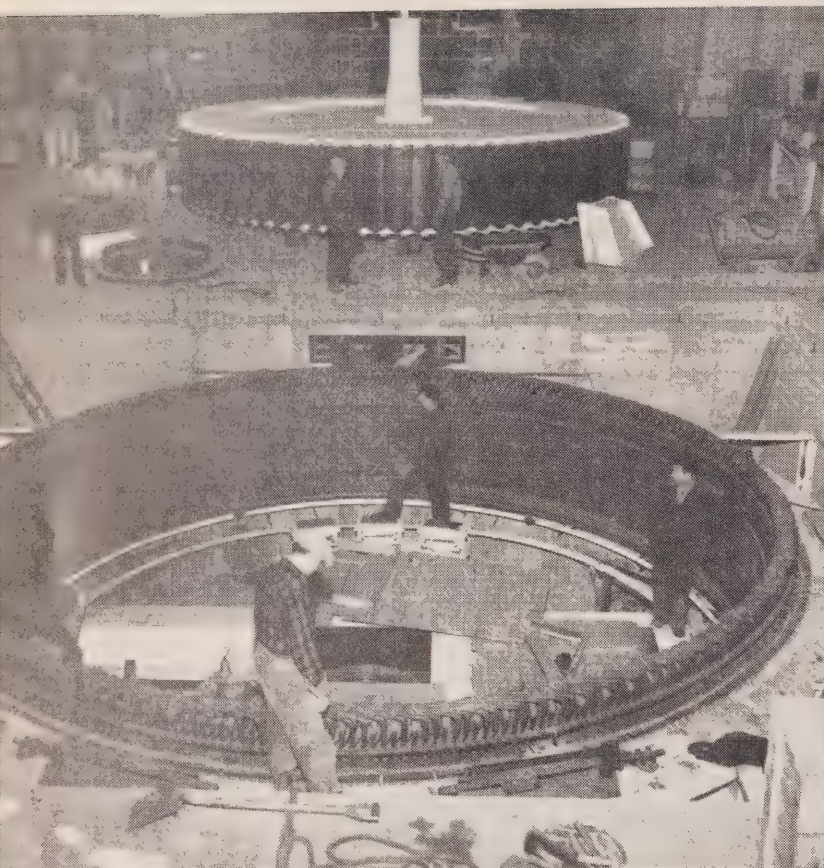
quired to accommodate the major component parts when installing or dismantling a unit. All of these features require very close co-operation among the civil, architectural, mechanical and electrical designers engaged on the project.

The rating and characteristics required for the generators are also determined through co-operative effort. The kilowatt and speed ratings of a generator must match the horsepower and speed rating of the turbine; the generator thrust bearing must be capable of supporting the weight of the revolving parts of the generator and turbine, including the thrust of the water flowing through the turbine; the bearings and rotor of the generator must be designed to withstand the maximum overspeed that the turbine may attain; the weight and diameter of the generator rotor must be large enough to provide sufficient inertia for proper governor control of the unit and for stability on sudden changes of load. The electrical characteristics of the generators must conform to the requirements of the system to which they will be

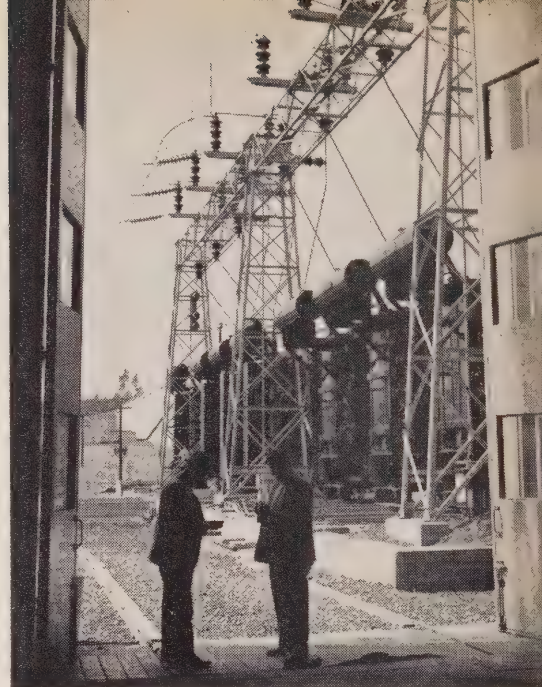
*(Continued on page 8)*







◁ ASSEMBLING a generating unit in one of Hydro's new powerhouses, with the stator shown in position. The rotor in the background weighs about 150 tons.



△ TWO banks of 138,000-volt main power transformers at Pine Portage Generating Station. Transformers of this type step up the power to the voltage required for transmission to the receiving stations.

## PATHWAYS TO POWER *(Continued from page 7)*

connected. Much of the information necessary for the preparation of a specification for the purchase of the generators is based on these requirements.

The schematic one-line diagram for the station and the choice of types, ratings and characteristics for transformers, circuit breakers and relays must conform to the requirements of the system planning engineers.

### Modern Trends in Design

In recent years the trend has been to enclose all medium and large size generators within a steel or masonry housing in order to keep the units clean, to reduce the noise and temperature in the powerhouse, and to improve their appearance. In such

units, the cooling air is recirculated through air-to-water heat exchangers mounted within the housing. Machines of this type may be equipped with a CO<sub>2</sub> fire protection system, actuated by protective relays, to reduce damage in the generator windings from fire due to an internal fault. Water sprinkler rings mounted within the machine provide added protection against fire damage.

Prevailing practice is to use only metalclad switchgear, with circuit breakers of the oilless type, within the powerhouse. With this type of switching equipment no live parts are exposed, thus reducing hazards to personnel. The use of oilless circuit breakers eliminates the possibility of an oil fire.

The choice of type of circuits required to convey the current from the generators to the transformers is mainly an economic problem. For small- and medium-sized units, these circuits are usually made up of insulated cables sheathed in lead and installed in ducts or supported on steel racks. For very large units, heavy busses of copper bars or tubes, mounted on insulators and enclosed in protective non-magnetic shields, will be required for these circuits.

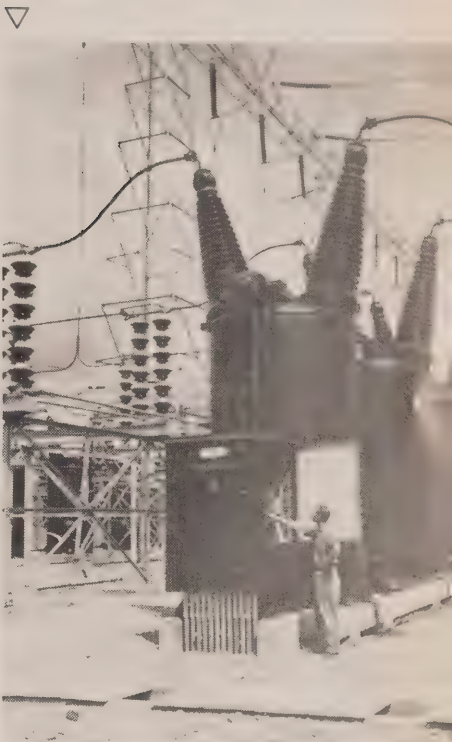
The selection of the type of cooling for power transformers is usually determined by the location in which they are to be installed, and the topography of the site near the plant will govern the choice of their location. Where space is limited, water-cooled transformers are selected. At some of the newer plants it has been considered economical to mount the



TRANSFORMER banks in some cases are located on the tailrace deck of a generating station. Power is generated at 13,800 volts and stepped up by these transformers at Des Joachims Generating Station to 230,000 volts for transmission to transformer stations at strategic locations.



MODERN circuit breakers for a 230,000-volt system can open a circuit in 0.05 seconds and close the circuit again in 0.5 seconds if appropriate relay equipment is provided.



transformers on a deck over the draft tubes on the downstream side of the powerhouse. Where ample level space near the powerhouse is available for their location, then the use of the larger, forced-air cooled type of transformers may provide the most economical overall arrangement.

In all modern plants the power transformers and high voltage switching are located outdoors. To shield this equipment and busses from direct lightning strokes, a series of wires (often called "sky-wires") are installed above the power circuits. These "sky-wires" are connected to ground at each supporting tower.

Electrical equipment and busses are frequently subjected to very high voltage surges caused by faults at

distant points and lightning on transmission lines. Power transformers and high voltage switching equipment are particularly susceptible to such surges. To minimize the possibility of failure, the insulation in equipment and busses must be co-ordinated in such a way that high voltage surges will discharge to ground through protective devices (lightning arresters or rod gaps) to avoid the puncture of insulation.

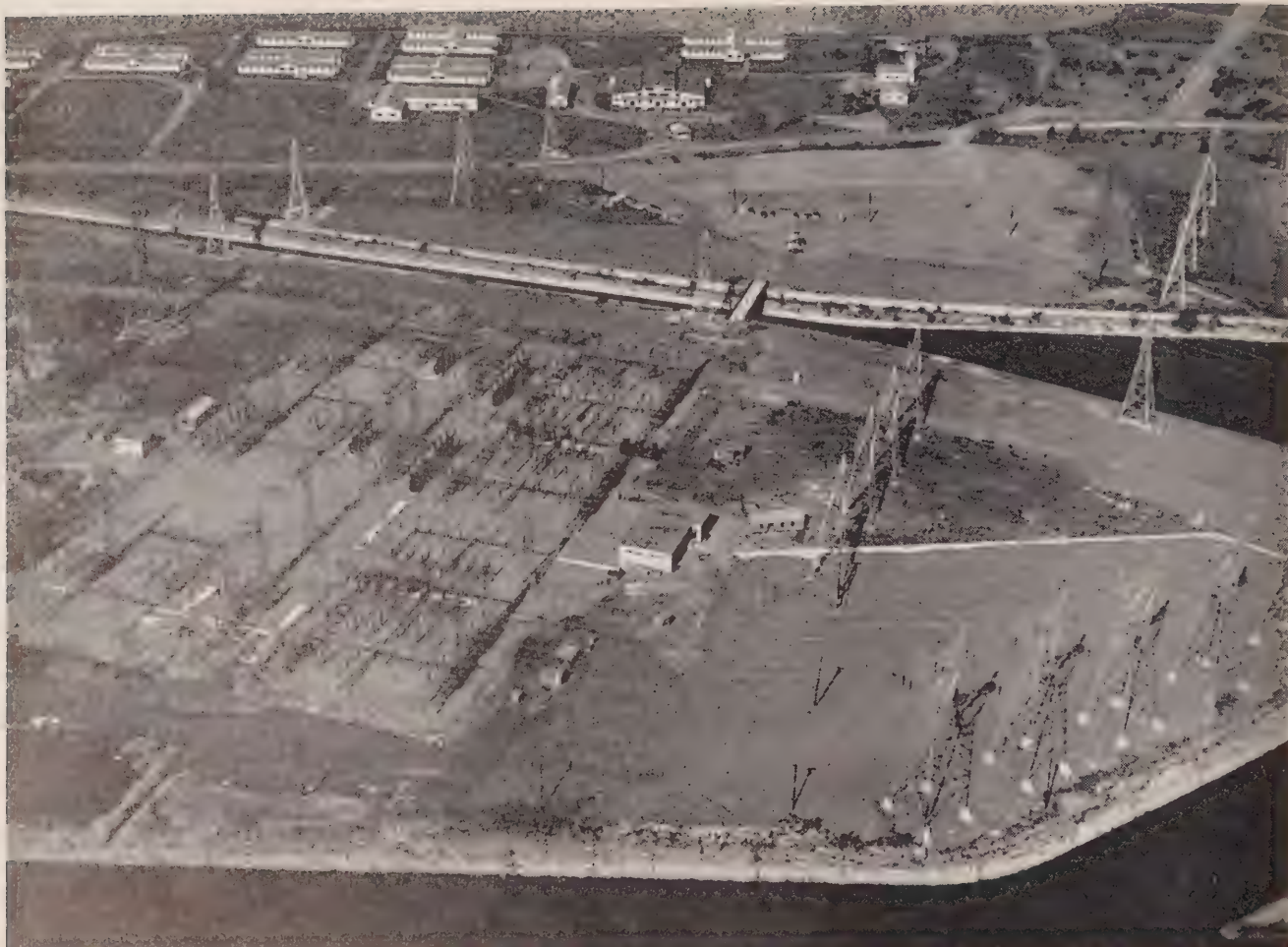
High voltage circuit breakers must be capable of quickly clearing faults on lines or at the plant in order to limit damage from faults. If cleared quickly enough, a fault on a line due to lightning causes no damage and service may be immediately restored. Modern circuit breakers for a 230,000-volt system can open a circuit in 0.05 seconds and reclose it in less than 0.5 sec-

onds if appropriate relay equipment is provided.

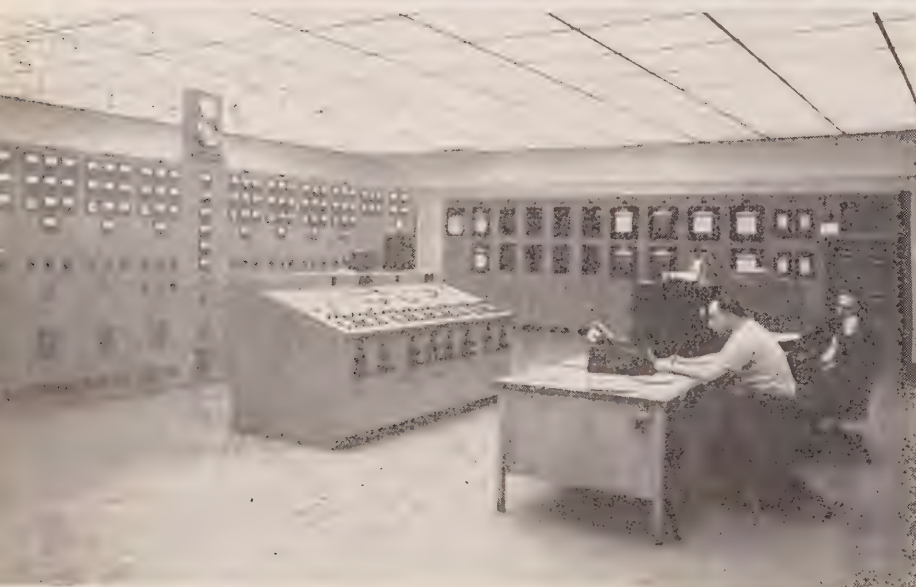
The control room is the "nerve centre" of the plant. In it are located switchboards from which the operators control the main equipment. The switchboards must contain sufficient meters to provide complete indication of the performance of each of the units and also control equipment for closing or opening all circuit breakers and for adjusting load and voltage on each unit. In large plants the following additional control and metering features are provided:

- 1) Facilities for automatically starting, synchronizing and stopping each unit.
- 2) Automatic load and frequency control, whereby the load fre-

*(Continued on page 10)*



Aerial view of a section of the high voltage switching equipment at the Sir Adam Beck-Niagara Generating Station No. 2.



MODERN control room at Hydro's Otto Holden Generating Station. The control room is the "nerve centre" of a generating station. Equipment includes switchboards which indicate the performance of each unit, as well as control facilities to permit operators to open and close circuit breakers and for adjusting the load and voltage on each generating unit.

## **PATHWAYS TO POWER**

*(Continued from page 9)*

quency of all or any selected number of units may be controlled automatically.

- 3) Telemetry facilities, by which the total load on the plant and forebay water levels may be transmitted to and indicated on meters in the Load Supervisor's room at Ontario Hydro's Head Office in Toronto.

The design of "control, metering and relaying" facilities for a large modern plant is the most intricate of the problems encountered by the electrical engineers. ■



# "AT THE CROSS-ROADS"

**D**R. RICHARD L. HEARN, Chairman of Ontario Hydro, told the annual meeting of the A.M.E.U., Toronto Region, at the King Edward Hotel, Toronto, that Hydro is now "at the cross-roads" on the question of future sources of power.

"After the St. Lawrence Power Project," said Dr. Hearn, "we are without any major hydraulic sites within reasonable distance of the large load centres of southern Ontario to meet future power demands. The capacity of our Southern Ontario System at the time of the completion of the St. Lawrence will be 4,600,000 kilowatts."

In predicting future power demands for southern Ontario, Dr. Hearn said it seemed fair to use the annual increase of 5.7 percent per annum which was experienced in the period between 1922 to 1950. On such a basis, Hydro will require about 5,000,000 kilowatts in the 15 years from 1960 to 1975. This demand will have to be supplied from higher-cost hydro-electric developments, thermal generation, or power imports.

Dr. Hearn went on to say that Canadian thermal power stations, until the present, have been mainly fired by coal, gas or oil. Ontario does not have any of these products available as natural resources in any appreciable quantity, certainly not enough to produce 5,000,000 kilowatts.

"The alternative to these fuels," he continued, "is the application of nuclear reaction to produce heat



ON the eve of his birthday, Dr. Richard L. Hearn, guest speaker, received the gift of a pipe from President H. R. McClymont, right, on behalf of the assembled A.M.E.U. delegates.



THIS group, seated, left to right: E. J. Woelfle, Toronto, Vice-President; Andrew Hamilton, Forest Hill, President; H. R. McClymont, York Township, Past President; standing, left to right: S. J. Pollock, Toronto Township; Ronald Harrison, Scarborough Township; William Marsh, Etobicoke Township, and R. H. Philp, Trafalgar Township, Directors, comprises the 1955 officers.

and, thus, steam for conventional turbo-generators."

Dr. Hearn pointed out that Ontario is blessed with a good percentage of Canada's presently-known uranium ore deposits — the necessary "fuel" for a nuclear reactor. "Thus, for the first time in many years, we have an alternative natural resource to help operate our future generators."

Reminding his listeners that Ontario Hydro has undertaken the development and construction of a small nuclear power generating station in co-operation with Atomic Energy of Canada Ltd. and Canadian General Electric Co. Ltd., the

speaker said that the undertaking is expected to provide reliable information on which to base designs for much larger plants of higher efficiency. He predicted that the road would be found to development of nuclear power at costs competitive with other fuels.

Dr. Hearn, who is a Director of Atomic Energy of Canada Ltd., a Crown company, promised that the public would be kept informed on the progress of this important development and that Ontario Hydro's findings would be made available to other utilities both in Ontario and elsewhere in Canada. ■

by J. G. Murphy



# Progress Markers

**INAUGURATE NEW**

**UTILITY BUILDINGS**

**AT PORT DALHOUSIE**

**AND PORT DOVER**

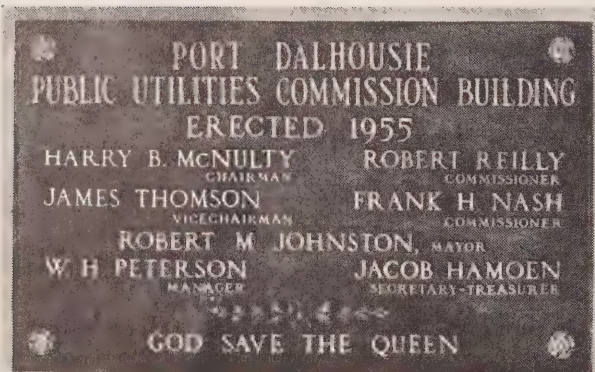
A PAIR OF golden scissors glinted briefly in the gathering twilight of a recent evening . . . a red ribbon parted . . . and the fine new headquarters building of the Port Dalhousie Public Utilities Commission was officially opened by Dr. Richard L. Hearn, Chairman of Ontario Hydro, heralding a proud new era of Hydro service for the Lake Ontario resort town.

Located at Main and Lock Streets in the central section of the community, the attractive new building replaces quarters in the town hall, which the utility has occupied since 1912, and brings the offices and other facilities of the local commission under one roof for the first time in its 43-year history.

Just before he cut the ribbon, Dr. Hearn told the large gathering of

P.U.C. officials, their guests, and townspeople gathered in front of the trim new headquarters, that the project "provides further evidence of the desire of the local commission to maintain the high standard of service that prevails in the province today. This new building will help to further the important cause of efficient and economic operation."

Noting the tremendous growth of Hydro generally throughout the province, and the many benefits that electricity provides in the everyday lives of its citizens, the speaker said it was obvious that Port Dalhousie has taken full advantage of such benefits. In this connection, he emphasized that the average monthly domestic consumption in Port Dalhousie is well above the average for Ontario.



◁ FORMER commissioner, Robert E. Rennie, who retired in December, 1953 after 30 years' service to the Port Dalhousie utility (Ontario Hydro News, April 1954), pays a visit to the new building, below. The plaque, left, has been hung in the lobby.





"The Port Dalhousie P.U.C.," he continued, "has been faced with ever-increasing demands for power and service. In spite of this, the commission members and management have maintained service standards, kept rates at a minimum; made provision for expansion such as this new building; and still ensured that a highly satisfactory balance is maintained between liabilities and assets. This is a commendable record, which I am sure will be recognized by Port Dalhousie citizens—even more so, perhaps, in the light of continual increases in the price of other goods and services."

### Impressive Ceremony

Members of the local commission participated in the impressive opening ceremonies, with Chairman H. B. McNulty acting as Master of Ceremonies. Vice-Chairman James Thomson, Commissioners Mayor R. M. Johnston, F. H. Nash, and Robert Reilly, Manager W. H. Peterson, and Secretary-Treasurer Jacob Hamoen occupied places of honor along the front of the flag-draped building, and brief addresses were given by Mayor John-

ston, and Commissioners Thomson and Reilly.

Among the guests taking part were Lt.-Col. A. A. Kennedy, President of the Ontario Municipal Electrical Association and recently-appointed Ontario Hydro Commissioner; H. A. Howard, President of the Association of Municipal Electrical Utilities, and A. S. Robertson, Manager of Ontario Hydro's Niagara Region. All paid warm tribute to the local utility and offered congratulations on its new building.

Earlier in the evening, at a well-attended dinner, Hon. Charles Daley, Ontario Minister of Labour, keynoted the opening celebrations with a timely address during which he said that Hydro is the basis for the prosperity of the province.

Citing an example of continued growth in Ontario in recent years, Mr. Daley said that, during a three-month period of 1954—some 55 million dollars worth of new industrial development was approved in the province, while this figure, for the same three months of 1955, rose to 65 millions.

"This is truly indicative of pro-

gress," he stated, "when industrial development is on the upgrade to the extent of ten million dollars in three months. Where there is industrial development, there must be Hydro development."

Going on to congratulate the Port Dalhousie P.U.C. officials and staff on their new building, Mr. Daley said "it is people like you in this community, who are dealing with our problems—and ensuring our progress. I am proud that Port Dalhousie is in step with the times."

### Hydro At School

During the day, as a fitting "Hydro Day" prelude to the evening ceremonies, some 225 Port Dalhousie school children were shown the Ontario Hydro film, "The Powerful Horseshoe," a graphic history in color of the early stages in the building of Hydro's giant Sir Adam Beck-Niagara Generating Station No. 2, and in addition heard addresses by P.U.C. Chairman McNulty, and Ontario Hydro Information Officer Harold Hillier.

Some of these children later saw Dr. Hearn officially open the new

*(Continued on page 14)*

REPRESENTATIVES of the present commission, left to right: Vice-Chairman James Thomson, Commissioner Frank Nash, Manager W. H. Peterson, Commissioner Robert Reilly and Mayor R. M. Johnston study a history of the system with Chairman H. B. McNulty, seated, centre.



CUTTING the traditional red ribbon across the main entrance, Dr. Richard L. Hearn, Ontario Hydro Chairman, officially opens the new building. Chairman McNulty and Vice-Chairman Thomson witness the ceremony.





building, a milestone in the electrical history of Port Dalhousie.

A modern split-level brick and block structure, with attractive stone facing, it houses the most up-to-date offices, storage and garage facilities to provide efficient customer service. At the same time, it has been designed to permit future additions to existing facilities.

From Lock Street, the main entrance provides access to a spacious public lobby and large general office, with separate adjoining rooms for executive offices and water storage and repair departments. The lower level of the building, which is accessible by a paved ramp from the rear, is utilized for truck and equipment maintenance shops, as well as storage quarters. A loading dock at the rear, too, facilitates the handling and despatching of equipment and material.

On one wall of the lobby is a large bronze plaque bearing the names of the present members of the local commission, as well as of Manager Peterson, and Secretary-Treasurer Jacob Hamoen. Immedi-

ately above the plaque hangs the picture of Sir Adam Beck, who is known as the Father of Ontario Hydro. On the opposite wall are framed pictures of several major Ontario Hydro power developments in the province.

#### A Bright Future

Looking across the business counter in the lobby, the P.U.C. customer or visitor will see the large, bright business office occupied by Secretary-Treasurer Hamoen, and Mrs. June Goodman, cashier.

The new building attests in every way to the fact that the Port Dalhousie Public Utilities Commission is not only keeping pace with current developments, but has given careful consideration to the municipality's needs in the years ahead.

If the past 10 years in the commission's development can be taken as a criterion, its future is bright indeed. According to figures revealed by Commissioner Robert Reilly during his address at the opening ceremonies, the total sales of the commission in kilowatthours increased by 158 percent between

SECRETARY-TREASURER Jacob Hamoen, left, and Mrs. June Goodman, cashier, are hard at work in the well-appointed business office on the main floor of the P.U.C. building.

1944 and 1954. Its sales to all classes of customers in 1944 totalled 2,838,620 kilowatthours; by 1954, total consumption had risen to 7,330,608 kilowatthours or more than 2½ times the 1944 figure.

A survey of the commission's earlier history, and a comparison with present demands, serves to further illustrate the steady growth it has enjoyed. In 1920, for example, eight years after the P.U.C. delivered its first power in Port Dalhousie, it was serving only 360 domestic customers whose monthly average consumption of electricity totalled 23 kilowatthours each. By the end of 1954, this number had increased to 890 domestic customers (an increase of nearly 2½ times) and the average monthly consumption per customer had risen to 542 kilowatthours—as Dr. Hearn observed—among the highest averages in the province. ■

—by Allan Jones.



# Gala Opening AT PORT DOVER

**M**ARKING the beginning of a new chapter in its unique history, Port Dover Public Utilities Commission also recently inaugurated its new headquarters with an informal gathering attended by commissioners, staff members, municipal officials, representatives of neighboring utilities and Ontario Hydro.

During the brief program, with P.U.C. Chairman Fraser Jarvis as Master of Ceremonies, brief addresses were given by Mayor H. J. Schneider, H. A. Howard, President of the A.M.E.U., and Superintendent Aaron McKnight. A feature of the program was the presentation of the Ontario Hydro film, "The Powerful Horseshoe," by J. B. Brown and Leo Mullen of the Commission's Information Division.

In his remarks, Mayor Schneider congratulated the Port Dover Commission on the acquisition of its new headquarters which he jovially described as "Aaron's pride and joy," denoting the gentle but constant pressure Mr. McKnight has exerted in persuading the local commission to purchase the new headquarters.

The Water Department occupies the basement, while Hydro facilities are located on the main and second floors. The first floor accommodates a general business office, furnished in sandblasted mahogany plywood in maple finish, and as well, provides space for a workshop, storage and supply rooms. The superintendent's office and a meter room are located on the second floor.

A two-storey structure of cement blocks and brick front. Port Dover's new utilities building stands on a half-acre of property fronting on the town's main thoroughfare, with access from a second street.

Purchase of the new building was completed early this year and renovations including building of partitions, extensive alterations to the business office, building of new ceilings, painting, rewiring and installation of fluorescent lighting have been carried out almost entirely by the three-man Hydro department staff consisting of Line Foreman John Lindsay, Joseph Belbeck, Meter Foreman, and Gordon Evans, lineman.

Representing a marked advance in Port Dover's electrical history, the new building recalls the town's

long association with Hydro. Situated on Lake Erie, Port Dover is a well-known commercial fishing centre and summer resort. For many years prior to 1908, electricity was supplied by a privately-owned electric plant which was forced out of business, due chiefly to competition from natural gas.

In 1921, a distribution system was built and the Commission supplied the first power to the municipality in December of that year. Between 1922 and 1954, the number of customers increased from 236 to 1,358. ■

**HIGHLIGHTING** the Port Dover event, Chairman Fraser Jarvis (holding scissors) cuts the ribbon held by Mayor H. J. Schneider across the doorway of the recently acquired premises while Commissioner Bruce Reid, left, Superintendent Aaron McKnight and Commissioners George Ross and Austin Powell, right, smilingly applaud this milestone of Port Dover P.U.C. history.



**MANY** friends of the Port Dover Commission were on hand to extend congratulations. Here Superintendent McKnight, centre, with, left to right, Chairman Jarvis, and P.U.C. staff members Gordon Evans, John Lindsay, and Joseph Belbeck reads a telegram from a "well-wisher."



# GENERATOR OVERCOATS



THERE has been a new look to Canadian Westinghouse generator frames arriving at the Sir Adam Beck - Niagara Generating Station No. 2 at Niagara Falls in the past few months. (This company has had the contract for supplying six of the 12 generators for the initial phase of the Niagara development. This company also has the contract for the manufacture of six, 55,000-horsepower motor-generator units for the Niagara project's pumped storage scheme now under construction.) It's not that the big components have undergone any drastic design changes; they're simply decked out in the very latest "overcoats" to guard against inclement weather. Not for them are the familiar over-sized piano crates usually seen on railway cars.

It all started not long ago when Westinghouse shipping people had to find some method of protecting a couple of 5000-horsepower motors from moisture, fire and other possible damage while the units were in transit and awaiting installation. Normally this would have involved routine procedures, but there was one small detail that caused some head scratching. The motors were due for installation aboard a marine vessel and clearance through the hatch into the

engine room was practically nonexistent. The use of customary heavy crating was out of the question. What was required seemed to be a form-fitting protective garment designed roughly along the latest Paris style lines.

That's just what the shipping experts came up with. A quick check of suppliers revealed that a local awning manufacturer had turned out a certain 18½ oz. duck material for the Navy that had met stringent specifications. It was reported to be water, fire, mildew and rot resistant and might well do the trick. Samples were obtained for thorough research laboratory analysis and the report gave an affirmative answer. The material did possess all the qualities demanded.

Special tailor-made covers were soon designed and fitted. With added padding for additional protection, the results were completely satisfactory and the big power plants took their rail journey from Hamilton well guarded against hazard.

To Perc Lawrence and Bob McGlynn, the Westinghouse shipping men who came up with the "duck-for-cover" solution, there was nothing particularly unique about the problem. As general shipping foreman and supervisor of shipping, re-

spectively, they had become accustomed to meeting similar posers in the course of handling hundreds of apparatus shipments annually. When Westinghouse built a number of generators for Brazil, packaging of the big machines for the long trip to their installation site called for plenty of imagination and know-how. Many normal techniques were of necessity thrown out the window. And again, a matter of clearance was involved for it seems that some of the bridges crossing Brazilian rail lines were too low to permit passage of large components crated in the customary manner. A solution to that one was found in specially-braced, metal-topped structures that passed with inches to spare.

A close look at that particular order further underlines the vital importance of efficient and economical apparatus packaging. Traveling by rail and water to the southern hemisphere, roughly 100 packing boxes, weighing from a few pounds to 57 tons, for the frames made the long trip south of Rio. Spider plates, each tipping the scales at 14,000 lbs., were separately packed and because of atmospheric conditions encountered through the sea voyage, additional protective measures had to be taken.

Under the widespread improvement campaign now being carried



on at Westinghouse, it was inevitable that further applications of the marine-motor protection technique would be sought and the first was found in the Sir Adam Beck frames. Actually, the new "over-coat" method was adopted not solely as a better system nor because of space limitations. From a performance standpoint, there is nothing vitally detrimental in crating components of this type in the usual manner and the practice will undoubtedly be continued in some cases. From a cost improvement angle, however, the advantages are significant. Where time and labor costs for crating the frames formerly added up to sizeable amounts, now they are packaged for shipment very quickly. Where heavy wood crates were previously written off as expendable at journey's end, the new

covers are returned from the delivery site for further use.

### Crack Resistant

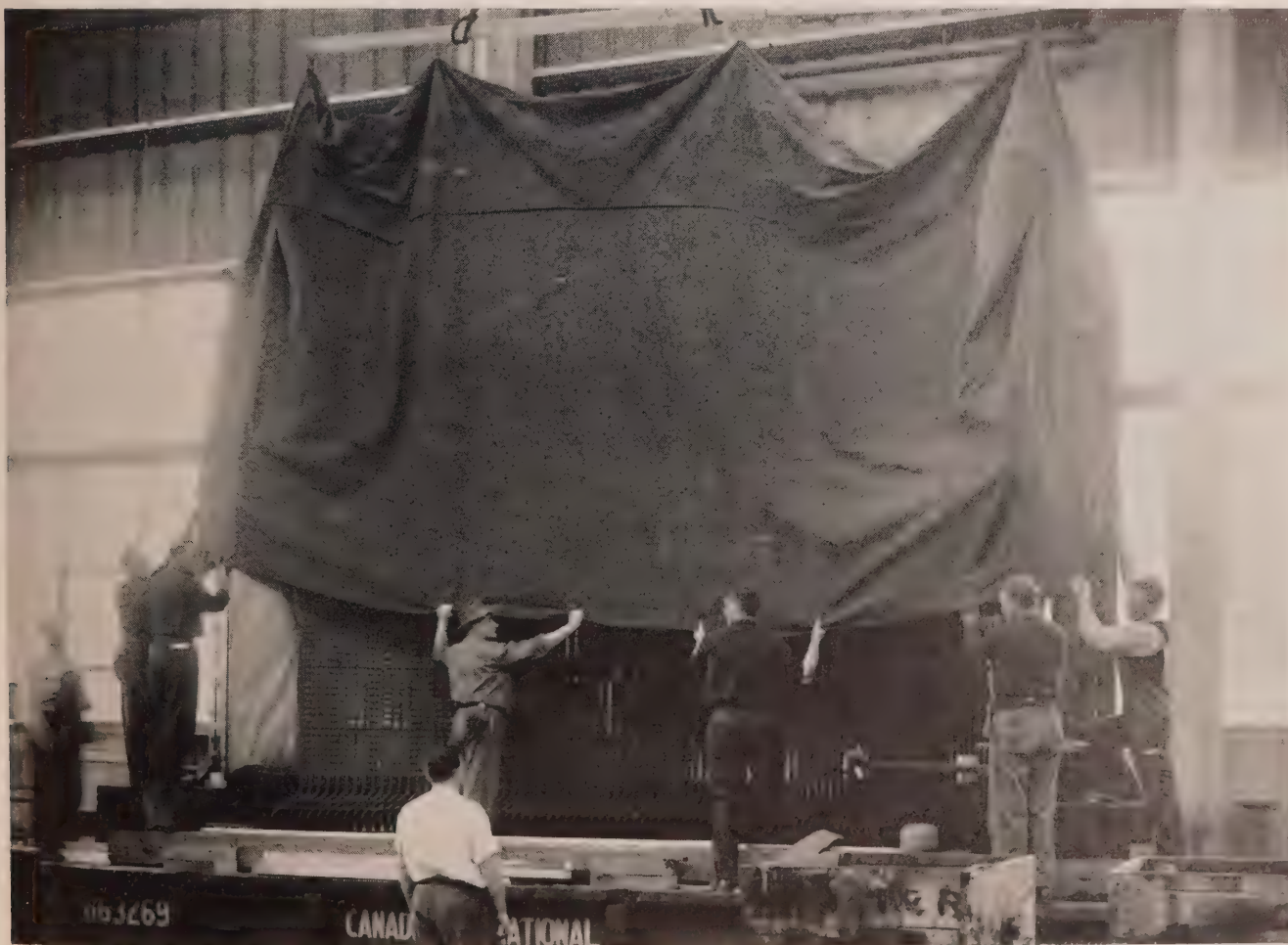
Efficiency-wise, the wooden crates had certain limitations and other types of tarpaulin revealed tendencies to crack and admit moisture after rough handling. The new material used by Westinghouse has proved to resist cracking at temperatures below -60 degrees F. and according to the company's Service Department, frames could be stored outdoors all winter if necessary.

Actual fitting of the two-part covers is a simple operation. The bottom half is arranged around a car-mounted wooden framework upon which the generator frame section rests during transit. The top half is then lowered by crane over the frame section and both halves are securely joined by 2" x 1/2"

battens. Bracing rods enter through sleeves in the cover and are easily accessible through zippered panels covered by storm flaps.

Upon arrival at the installation site, bracing rods are released and a lift beam is lowered to the top of the frame section after tear-off patches have been removed. The lift beam is then connected to the frame by 4" studs for which spaces have been provided in the cover. Bolting of the beam to the frame is accomplished through the large, zippered openings. Then the frame, cover and all, is lifted to a float for moving to the powerhouse. The strongly-adhesive tear-off patches may be replaced if desired. ■

CRANE lowers special duck covering over generator frame before shipment to Hydro's Sir Adam Beck-Niagara G.S. No. 2.



# New Lease on Life

**Brantford P.U.C. converts abandoned  
substation into modern service building**



△ ONE-STORY brick addition, which includes office space for the stockkeeper and line superintendent, forms the main entrance to the converted substation. A section of the new, six-car garage, which also houses ladders and heavy equipment is visible on the left.

**T**AKE AN OLD BUILDING, add some architectural ingenuity and imagination, plus a bit of courage, and you can turn an apparent white elephant into a definite municipal asset in a short time.

Brantford Public Utilities Commission proved that recently when they completed the conversion of a former substation into a modern service building.

The old substation had stood at 5 Murray Street, Brantford, for more years than most citizens of that bustling city cared to remember. It was a substantial, solid brick, one-storey building that time had seemed to pass by. Built by the Dominion Power and Transmission Company — around 1913, it is believed—the building was taken over by the Brantford Public Utilities Commission in 1932. Abandoned as a substation in 1953, except for the outside transformers, its long life of useful service to the community seemed to be at an end, and there was something rather forlorn and uncertain about the aging structure.

Yet, its location, its spacious grounds and 2,800 square feet of floor space presented a challenge to the P.U.C. officials, who felt something could be done to reclaim it from obscurity and the threat of destruction.

One thing the P.U.C. needed desperately was a place for its stores and line crews. Stores were housed in two separate buildings, but it was felt that better stock control could be achieved by placing these all under one roof to facilitate improved service to Brantford's electrical customers.

In renovating the venerable structure, the Brantford utility took advantage of its height by converting it to a two-storey building, and added a one-storey, brick entrance. Offices are now provided in the one-storey addition for Stockkeeper Bob Hamilton and Line Superintendent William Emslie.

Rapidly-moving stores items are located on the first floor, being con-



veniently arranged in bins and on shelves which were moved intact from their previous locations. Cement blocks have been used in the lower floor partitions, while lighting is provided by single-tube fluorescent fixtures. Hardwood flooring is installed in this section of the building.

### Additional Storage Space

Additional storage space for items of equipment and supplies not required in daily operations, as well as a modern recreation room, are located on the new second floor. An adjacent locker room for linemen's equipment, built by crew members during inclement weather, takes up another portion of the new floor.

The recreation room for the Brantford line crews, in natural wood finish, set off by a green and cream color scheme, inlaid linoleum flooring and two-tube, flush-type fluorescent fixtures, has an attached kitchen and washroom.

Equipment and other materials destined for long-term storage are raised to the second floor through a shaft by a 500-pound hoist. The hoist is suspended from a track which facilitates placing the heavier equipment at any point desired. The shaft is totally enclosed and fire-proof, with access from the lower floor being made through a fire-door. An oil-fired, forced-air heating system, supplemented by electrical heating in the office section of the lower floor, has been installed in the building.

Housing the Brantford Commission's six trucks is a new, brick garage, 66 feet by 28 feet, adjacent to the stores building. Floored with concrete, the garage also accommodates the ladders and heavier equipment used in line work.

Today, Brantford P.U.C. representatives are proud to show visitors what the face-lifting has accomplished in turning this seeming white elephant into an attractive and durable asset. The task of remodelling the old substation, together with grading and a 1,000-foot fence, cost



LABELLED bins and shelves in the stores section of the building facilitate this inventory check of line hardware by Harry Lucas, left, and Stockkeeper Bob Hamilton, centre.

approximately \$51,000, while the expenditure for the new garage was slightly more than \$14,000.

### Accessible Location

A particular advantage of this new, centralized stores and garage accommodation is its ready accessibility. Even a new street, requiring 350 loads of slag, has been opened by the Brantford Commission which now has its own railway siding adjacent to the property. A special, detachable section of fencing enables direct unloading of poles from railway cars in the processing area, while a covered platform at the rear of the service building, equipped with a trolley-type hand chain hoist, has been built for moving and storage of transformers and associated equipment. Electric pumps have been installed to provide water for the spacious lawns surrounding the buildings.

Recent annexation of a section of Brantford Township by the City of Brantford involved assumption of a substantial share of the township's electrical distribution system and customers of the Brantford Township Hydro - Electric Commission. But, with the increased facilities

*(Continued on page 24)*



COVERED platform at the rear of the new service building is used for the storage and repair of transformers and other equipment.



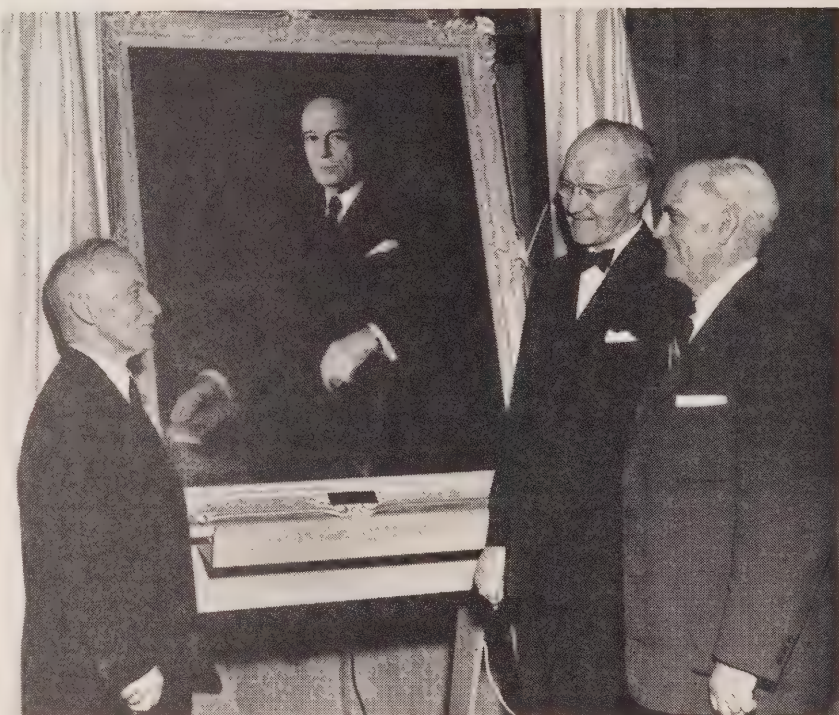
# WINDSOR HONORS

## "SUPER-CITIZEN"

**J.** CLARK KEITH, bearing such unofficial yet affectionate titles as Windsor's "Super - Citizen" and "Public Servant Extraordinary," received many moving tributes on the occasion of a special dinner held May 27 in Windsor's Prince Edward Hotel to commemorate his retirement on July 1, 1955, as General Manager of the local utilities commission. Some 150 close friends and long-time intimate associates in Hydro, civic and business circles from many parts of the province attended the dinner.

For 35 years, Mr. Keith has devoted himself not only to the interests of the Windsor Utilities Commission, but has been perhaps one of the most civic-minded and active citizens the city has ever had. Few movements of importance have taken place in the community during the past three decades or more in which he hasn't been a vigorous participant. As a professional civil engineer for more than 44 years, Mr. Keith has achieved a national reputation for his outstanding ability.

So it was that on May 27 those who knew him best, who knew the merit and significance of his many-sided career, came and addressed their tributes to him and to Mrs. Keith. Chairman of the dinner was Gordon H. Fuller, Chairman, Windsor Utilities Commission, who joined with his fellow-commissioner, Warren P. Bolton, in presenting Mr. and Mrs. Keith with a silver tea service on behalf of all those present.



MR. KEITH, left, with Ontario Hydro Vice-Chairman W. Ross Strike and Windsor Chairman Gordon H. Fuller, right, discuss oil painting presented to Mr. Keith by Ontario Hydro. The portrait will hang in the new offices of the Windsor Commission to be opened later this year.

In making the presentation, Mr. Bolton said that "Clark and Mrs. Keith have earned the leisure time that awaits them. However, we are very glad that we will continue to have Mr. Keith's advice after July 1 as a consultant to our commission. Always, in times of stress in the past, or when we have been stuck on a problem, we have been able to turn to Mr. Keith for a solution."

Later, Ontario Hydro Vice-Chair-

man W. Ross Strike emphasized the same viewpoint, commenting that "Clark Keith has been one of those people in the province upon whom we at Ontario Hydro, down through the years, have relied on for wise counsel." Since 1951, Mr. Keith has been a member of the Ontario Hydro-Electric Advisory Council.

Continuing, he said: "Our character is written in our faces and you have only to look at Mr. Keith to



see that kindness, that strength of character and happy attitude, born of a job well done and a satisfied people whom he served."

Turning to Mrs. Keith, Mr. Strike spoke feelingly of the "great assistance and support she has contributed. Behind every successful man is a loving and devoted wife."

Mr. Strike then gave a signal for an oil portrait of the distinguished engineer to be unveiled, saying that Mr. Keith should regard his retirement as "the crown of his life."

### Municipal Tribute

The Mayor of Windsor, Michael Patrick, expressed the city's "deep appreciation of Mr. Keith's 35 years of great service. The outstanding job he has done, his integrity, understanding and devotion are examples for all of us in this community." Mr. Keith is credited with the solution of many problems involved in the 1935 amalgamation of Windsor with other border municipalities.

Lt. Col. A. A. Kennedy, newly-appointed Ontario Hydro Commissioner, said that "as President of the O.M.E.A., I know the great help Clark Keith has been, not only to the association, but to the municipalities. The people of Windsor have been very lucky to have had a person of his calibre."

Speaking on behalf of the Association of Municipal Electrical Utilities, of which Mr. Keith is a Past President, Ron Mathieson, Secretary of the Association, said that "we claim Mr. Keith as our own and have made him an honorary life member."

Greetings from the American Waterworks Association came from Dr. A. E. Berry, Secretary of the Canadian Section, who stated: "We have given Mr. Keith all the awards it has been possible to give him. He has made a tremendous contribution to the Association and his influence has gone far beyond the boundaries of the City of Windsor." Mr. Keith is a Past President of the

Canadian Section, and in 1949 received the Fuller Award for distinguished service in the water supply field.

### Engineering Contribution

A Past President of the Ontario Association of Professional Engineers, Mr. Keith received warm tributes from the Association's Director, Col. T. M. Medland. "To try and compress the engineering contributions made by Mr. Keith into two minutes is beyond my capabilities, but it is significant to note that Mr. Keith has the longest record of service to the Association of any member—19 years; he holds the 419th membership in the Association which today has 16,830 members."

Dr. John Howie, Chairman of Windsor's Metropolitan General Hospital, reviewed Mr. Keith's tremendous contributions in the hospital field, both in Windsor and in Ontario as a whole. As Past President of the Ontario Hospital Association, Mr. Keith formulated the plans and engineered the building of Windsor's Metropolitan Hospital

and served for eight years as Vice-President of the Blue Cross Plan for prepaid hospital care.

Indeed a highlight of the dinner was J. Clark Keith's reply to so many eulogies. "What can a man say in the face of the sea of kindness that has come to me?" he stated. He also spoke gratefully of the many compliments which had been extended to Mrs. Keith. "Few know the many sacrifices which must be made by the wife of a man in public service."

Summing up his years in public office, Mr. Keith said that the "early days taught me not to make promises I could not fulfill; in making policies, I learned that once you have established them, you should never make concessions to them if you wish to keep out of trouble; if the policies are wrong, change them, but don't compromise with them."

"This community has progressed not because of me, but because of the people who have helped me. In accepting my responsibilities as a

*(Continued on page 24)*



EXPRESSING the esteem of a large group of friends, Windsor Commissioner Warren P. Bolton, right, presented a silver tea service to Mr. and Mrs. Keith during the complimentary dinner.



# MARKED EXPANSION

DELEGATES from across Canada gathered in Toronto recently for the fourth annual meeting of the Canadian Adequate Wiring Bureau and heard reports indicating that the past year has brought a marked expansion in both the volume and variety of efforts to promote adequate wiring on a national scale.

The Bureau, which is essentially

a service organization, exists for two main purposes: first, to organize and assist electric service leagues and, secondly, to assist the provincial leagues in conducting a direct consumer educational campaign involving all media, including newspapers and other publications, radio and television and direct contact with other groups to whom the adequate

wiring story can be given by a league or Bureau speaker. The ultimate aim of the Bureau is to establish electric service leagues in all provinces of Canada and to work with provincial organizations in setting up local leagues.

Provincial organizations are now operating in all provinces except Manitoba and the Maritimes, but reports from representatives of these areas, presented at the recent meeting, indicated that leagues are either in the process of being formed or will soon be formed.

The report of President W. N. Herod of the Electric Service League of Ontario showed that the League certified nearly 8,000 Red Seal homes in all parts of the province in 1954 and, at the end of the year, certification was pending in the cases of more than 4,000 homes in which wiring has not been completed.

## Annual Conference

It was announced at the conclusion of the meeting that the Ontario League would be host for the 20th annual conference of the International Association of Electrical Leagues to be held in Toronto in October. The program of the conference will include speeches and discussions by league directors and managers from all parts of North America on the promotion of adequate wiring and products which create the need for adequate wiring. Each of the established Canadian leagues is a member of the international association. ■

—by J. G. Murphy.



T. C. THOMPSON, seated centre, Manager of the Canadian Adequate Wiring Bureau, explains a point to Director Norman Frank, left, and M. J. McHenry, Ontario Hydro, retiring President of the Bureau, right. Standing is Robert Bailey, Montreal, who was elected to the presidency.



C. S. LEARY, Toronto, right, shows a lively interest as veterans Art Wilson, Toronto, centre, and A. W. J. Stewart, Past President of the Electric Service League of Ontario, reminisce between sessions of the meeting.



# ALONG HYDRO LINES



## Honor Blenheim Hydro Manager

W. B. Ford, Manager and Secretary of Blenheim P.U.C., and Manager, Blenheim Area, Ontario Hydro, was honored recently by Blenheim P.U.C. at a testimonial dinner marking 25 years' service with Ontario Hydro. Civic officials and Hydro colleagues attended the dinner, during which Mr. and Mrs. Ford were presented with gifts of appreciation.

Mr. Ford began his Hydro career at Chatham in 1930. He later served as Superintendent at Oil Springs, transferring to Blenheim 15 years ago. He has been a member of the Association of Professional Engineers since 1938. A host of associates paid tribute to Mr. Ford's services, including Blenheim's Mayor John Fleming, who lauded his contributions to the building of an efficient Hydro system as well as his participation in church, lodge, service club, schools and other local activities.

## Hydro Establishes Two New Scholarships

Ontario Hydro has announced the establishment of two new engineering scholarships at the University of Western Ontario, London. This brings to a total of 11 the number of scholarships the Commission now awards annually to Ontario educational institutions.

The two new awards of \$300 each will be given to the most deserving students at the end of the first and second years of a two-year engineering course recently inaugurated at the University of Western Ontario. Because the first year of the new course has just been completed, only one of the new Hydro scholarships will be awarded this year.

Hydro provides nine other scholarships distributed among the University of Toronto, Queen's University and the Royal Military College of Canada at Kingston; the Ryerson Institute of Technology at Toronto, and the Lakehead Technical Institute in Port Arthur. The awards are presented to encourage and assist promising engineering and technical students, as well as to honor the outstanding work of engineering graduates of Canadian universities in the fields of power generation and distribution. Winners of the awards for the 1954-55 school year will be announced later this year.

## Pole Hole Cost Slashed

Cost of digging pole holes in Peterborough has slumped to \$3.15 apiece. The slump followed approval by the Peterborough Utilities Commission, on the recommendation of General Manager W. Howard Powell, of the purchase of an \$1,868 pole hole digging machine. Mr. Powell said a laborer can dig one hole in half-a-day at an estimated cost of \$7.60, but the machine, operator and one laborer, can dig four holes in half-a-day, reducing the cost per hole to \$3.15.

## Appoint Director, Nuclear Power Project

Appointment of Harold A. Smith as Director, Nuclear Power Project, has been announced by the Commission. Since January, 1954, Mr. Smith has been stationed at the Chalk River plant of Atomic Energy of Canada Limited, serving for the greater portion of this time as Project Co-ordinator of an 11-man team carrying out joint studies of the feasibility of generating power from nuclear reactors. Mr. Smith's latest appointment follows closely upon the recent announcement that Ontario Hydro would participate with Atomic Energy of Canada Limited and the Canadian General Electric Com-



Harold A. Smith

pany Ltd. in the design and construction of a nuclear-electric plant to be located on Hydro property at Des Joachims on the Ottawa River (see page 2). Mr. Smith, a graduate of Queen's University in electrical engineering, has been associated with the Commission since 1940, except for a two-year period of service with the Royal Canadian Navy. For his work on the design and construction of new naval radar equipment, he was awarded the M.B.E.

## RICHARD M. DURNFORD

**R**ICHARD M. DURNFORD, a former President of the Ontario Municipal Electric Association, and a member of Ontario Hydro's staff since 1948, died suddenly in Toronto on June 8.

Born at Oil Springs, near Sarnia, in 1893, he was educated in Sarnia public schools and at Kitchener Technical School, later completing a course in Toronto which qualified him to teach in Ontario technical schools.

He then served as a machinist apprentice on the CNR and for five years was assistant supervisor of apprentices. In 1922 he became machine shop instructor at the Sarnia Technical School, serving in this capacity until 1930, when he joined McPhillips Ltd. in Sarnia. He remained with this firm until 1940



R. M. Durnford

when he entered war work with the Ontario Department of Education, instructing in war emergency classes at Sarnia until 1944. In that year, he became associated with Central Mortgage and Housing Corp.

He joined Ontario Hydro in 1948 as an assistant to the Director of Consumer Service. Then in May, 1951 he was transferred to the Toronto Region as Liaison Officer for advanced frequency standardization work in the Toronto area. For the past year he has been Domestic and Commercial Supervisor with the Commission's Frequency Standardization Division.

Before joining Ontario Hydro, Mr. Durnford served from 1942 until 1948 on the Sarnia Hydro-Electric Commission and was Chairman in 1944. He was President of O.M.E.A. in 1946 and 1947.

He is survived by his wife and one daughter, Mrs. Donald Wormith, of Sarnia, and also by a brother, Dr. A. W. Durnford, University of Western Ontario, London, as well as two sisters, Mrs. C. G. Clarke, London, and Mrs. Arnold Tuckey, of Vancouver.

## Hespeler Sets Policy On Flat Rate Heaters

Hespeler Hydro - Electric Commission has established a policy on flat rate water heaters purchased by customers for installation in local premises. The policy is stipulated in the following motion recently approved by Hespeler commissioners:

"That any type of water heater with a permanent outside metal jacket with a minimum of two inches of fibreglass or rock wool insulation be accepted for flat rate. These heaters must have efficient thermostatic control on each heater so wired that only one heater operates at one time. Installation must be inspected by the local utility as well as the H.E.P.C. The local commission retains the right to inspect the installation at any reasonable hour as long as the heater is on flat rate."

The commission also approved a motion that service on heaters purchased through the local office would be provided for a period of a year from the date of purchase. Thereafter, customers must obtain service from electrical and plumbing tradesmen.

## WINDSOR HONORS "SUPER-CITIZEN"

*(Continued from page 21)*

citizen, experience has taught me that responsibility cannot be delegated; you can delegate tasks to other people, as one must, but the final responsibility of seeing they are done rests with the person authorized to delegate."

### Presents Portrait

Mr. Keith also took the occasion to offer the oil portrait of himself, presented earlier by Mr. Strike, to the Windsor Utilities Commission. The gift was accepted by Mr. Fuller on behalf of his fellow-commissioners and will hang in the local commission's new office building, which will be opened later this year, Mr. Fuller stated.

Typifying the community feeling toward J. Clark Keith is the following excerpt from an editorial in the *Windsor Daily Star*, April 14, 1955: "As he retires to a well-earned rest, Mr. Keith is entitled to a hearty vote of thanks from the people of the community. There are few who have served so many so well for so long."

Succeeding Mr. Keith as General Manager of the Windsor Utilities Commission will be J. E. Teckoe, Jr., a well-known and much respected citizen of Windsor, who, for the past four years has served as Assistant General Manager.

—by D. A. Heeney.

## NEW LEASE ON LIFE

*(Continued from page 19)*

available in the new service building, Brantford P.U.C. experienced little difficulty in handling the addition of 3,803 more customers and some 53 miles of distribution line to the city Hydro system.

Today some 33 employees operate from the new service building, of whom six are engaged in stores work, while the commission maintains 96 circuit miles of distribution line which serve a total of 16,232 customers.

No wonder then that the 40-year-old, rejuvenated substation has taken a new and long lease on another phase of its useful life of service to the citizens of Brantford.

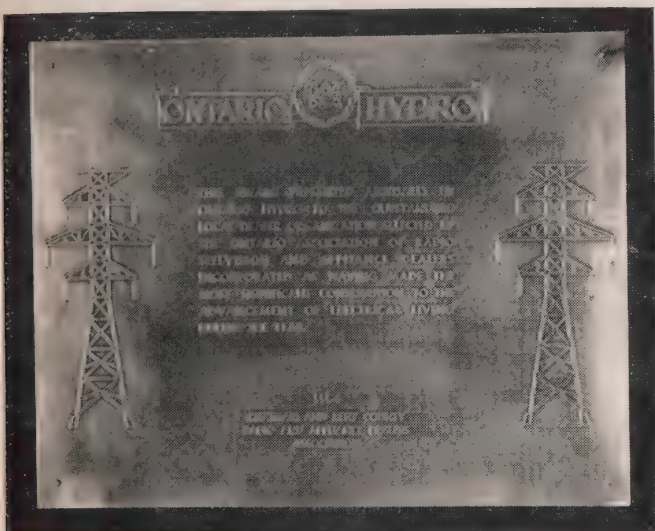
—by Horace Brown.



# FOTO-NEWS



**ELECTRICAL LIVING AWARD** - For the second year in succession, Chatham and Kent County Radio and Appliance Dealers' Association has been selected by the Ontario Association of Radio, Television and Appliance Dealers Incorporated as the winner of the Ontario Hydro citation for its contribution to the advancement of electrical living. In the photo below, James A. Blay, Ontario Hydro's Director of Information (left), is shown presenting the plaque for the 1954 achievement. The plaque reads: "This award presented annually by Ontario Hydro to the outstanding local dealer organization selected by the Ontario Association of Radio Television and Appliance Dealers Incorporated as having made the most significant contribution to the advancement of electrical living during the year." Shown with Mr. Blay, front row, left to right: Wilf. Hodgins, Secretary-Manager of the O.A.R.T.A.D. Inc.; Allan Shillington, Blenheim, President of the Chatham and Kent Association, and Gordon Sharpe, of the Chatham Public Utilities Commission and Secretary-Treasurer of the local association. In the back row, left to right, are: Herb. Caplan, President of the Ontario Association, and Ab. Brundritt, a Director of both the local and Ontario Associations. The plaque is reproduced in the photograph on the left.











# ONTARIO HYDRO NEWS

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## POWERFUL STIMULUS

"CANADIAN industry will get a great stimulant . . . as Ontario Hydro and the New York State Power Authority enter their first full year shortly on major construction of the St. Lawrence Project." The foregoing observation from the news columns of a recent issue of the Ottawa Evening Journal constitutes a prophecy, which can be justified by examining the facts.

Already 20 different contracts, with a total value of more than 77,900,000, have been awarded by Ontario Hydro for its share of the large power development to 16 Canadian companies or organizations employing resident staffs. These contracts represent increased employment for Canadian workers and an augmented use of Canadian materials.

For example, most of the electrical equipment ordered to date for Ontario Hydro's share of the development will be manufactured in Canada — within the boundaries of Ontario in fact. Canadian General Electric Company Ltd., Toronto, and Canadian Westinghouse Company, Hamilton, both of which employ large Canadian staffs, will each manufacture and install eight generators for the 16-unit Canadian powerhouse near Cornwall, while Canadian Westinghouse has received a further contract for the manufacture of thirteen, 86,000 kva transformers. English Electric Co. was the successful bidder for the manufacture and delivery of 16 turbines and governors, while powerhouse switchgear will be provided under contract by Brown Boveri (Canada) Ltd.

The major contract, to date, has been let for the construction of the Ontario section of the powerhouse to Iroquois Constructors Limited, Toronto, for the sum of \$21,940,253. This firm represents a combination of five experienced and well-known Canadian companies, several of which have completed important construction and engineering undertakings for the Commission. In addition, important contracts have been awarded to: Cementation Company of Canada, Montreal; Mannix-Raymond Limited, Montreal; Canada Cement Company, Montreal; Steel Company of Canada, Hamilton; Burlington Steel Co. Ltd., Hamilton; C. A. Pitts General Contractor Ltd., Toronto; Sir Robert McAlpine and Sons, Toronto; Atlas Construction Co., Westmount Que., Macamic (Ontario) Ltd., Timmins; Beaver Construction Company, Montreal, and Canadian Dredging and Dock Co. Ltd., Toronto.

Thus, quite apart from the significant dividends which this important power development will yield in the form of hydro-electric energy when it is placed in service in 1958, the magnitude of the project and the materials and equipment required in its construction will exert a far-reaching influence upon Canadian employment and upon the tempo of Canadian business and industry within the next two or three years.



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### COVER PHOTOS

OUR front cover for this issue salutes the World Brotherhood of Scouts and the eighth World Scout Jamboree, which is being held at Niagara-on-the-Lake, August 18 - 28. During the Jamboree, many of the 10,000 Scouts, representing some 50 nations, will be viewing Hydro's new Sir Adam Beck-Niagara Generating Station No. 2 and the famous floral clock nearby (both are depicted in the cover illustration along with a prototype of a Canadian Scout), as well as other major Hydro developments, which are regarded as important attractions at Niagara for thousands of international visitors each year.

An enterprising member of the photographic staff of the Cornwall Standard-Freeholder recorded the unusual impression of the Hydro transmission tower on the back cover.

Material published in Ontario Hydro News may be reprinted without permission. Most photographs are obtainable on request. If required, stereos will be provided.





Brave flowers, that I could gallant it like you,  
And be as little vain!

HENRY KING, *A Contemplation Upon Flowers*





NEW industries, housing subdivisions and commercial developments flank Eglinton Avenue, known as Scarborough's "Golden Mile" (centre of this photograph), typifying the remarkable expansion which has taken place in this bustling Hydro municipality in the past 10 years.

# SCARBOROUGH'S GOL



**Regarded as one of North America's "fastest-growing" areas, progressive township on Toronto's eastern outskirts has been a Hydro municipality since 1917**

**W**HEN a community develops to the point where it is said to be one of the "fastest-growing" and most progressive areas in North America, it is generally regarded as something of a phenomenon.

A case in point is the Township of Scarborough, on Toronto's eastern outskirts. And as the story of the municipality's revolutionary development unfolds, it becomes clear that Scarborough's golden era is directly related to the availability of low-cost power.

The Scarborough of today, with its famed "Golden Mile"—a stretch embracing recently-established industrial and commercial developments, valued at close to one billion dollars—is a far cry from that distant day in 1793 when the township was given its name by the wife of Colonel John Graves Simcoe, then Lieutenant-Governor of Upper Canada. The name was inspired by the resemblance which the cliffs of the area, rising loftily from Lake Ontario, bear to the shore line of Scarborough in England.

The Ontario Scarborough is a combination of the pioneering past, being, as it is, one of the oldest

populated centres in Ontario and, as has been indicated, one of Canada's greatest areas of industrial concentration. That the pioneering spirit of its early residents remains, is visible in the initiative displayed by its modern-day residents, who, in so short a time, have raised the township to the vanguard among other municipalities in Canada.

Initiative is the necessary spark to progress; but it's axiomatic that the modern community, with all its industrial and commercial ramifications wouldn't achieve much in the way of progress without the help of electricity. In the case of Scarborough, the pace of the township's spectacular development was made possible, to a large degree, by its ability to meet soaring electrical demands.

Hydro was first introduced to Scarborough in 1917 under the name of the Scarborough Hydro-Electric System, with George Green as Superintendent of the system. Mr. Green's home on Haig Avenue was also his office, and it was from here that he gave information, accepted applications for Hydro service, kept books and issued accounts

and other correspondence. He also read the meters. In fact, with the exception of George Lecuyer, whom he had engaged as electrician to make the necessary connections, he was, at that time, the whole staff of the township's Hydro system. In 1920, Hydro was combined with the municipality's waterworks system and a public utilities commission was formed. Mr. Green was appointed manager and acted in that capacity until his resignation in 1922 when George Lecuyer was named Superintendent with W. D. Annis as Secretary-Treasurer.

The present manager of the township's public utilities commission, Ronald Harrison, assumed this post in 1926, and it is, in a large measure, due to his administrative skill and the foresight of succeeding commissions that the utility has been able to maintain service at maximum efficiency during Scarborough's great expansion period.

#### **74 Customers In 1917**

When power was first turned on in Scarborough only 74 customers had signed contracts. Indicative of the growth of the township and of

*(Continued on page 4)*

by J. G. MURPHY

# N ERA

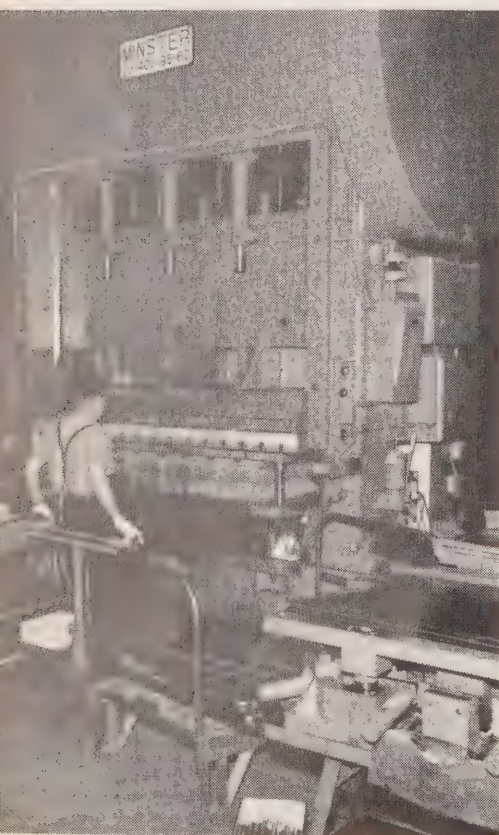
△ ATTRACTIVE, new housing subdivisions are numerous in Scarborough Township where the number of domestic Hydro customers increased 440 percent from 1944 to 1954.







MANUFACTURING aircraft equipment, Lucas-Rotax Ltd. is one of several firms which have built plants in Scarborough Township in the last decade, sending electrical consumption soaring.



THIS large press is stamping out panels for electric refrigerators in the Scarborough plant of Frigidaire Products of Canada Ltd.

the part played by Hydro in that development are the following facts: at the end of 1954, there were 32,255 domestic customers, 1,457 commercial customers and 330 power customers—a total of 34,042. In 1954 alone, approximately 12,000 customers were added when Scarborough P.U.C. took over the distribution of electricity to Agincourt and that part of Markham Rural Operating Area lying within the township boundaries from Ontario Hydro. It might also be noted that where the average cost per kilowatt-hour to domestic customers in 1921 was 4.6 cents, it had been reduced to 1.4 cents in 1954. Service increased over the years but the cost of service decreased.

Other factors in the statistical story are equally illuminating, particularly in the last 10 years. In 1944, the number of domestic customers was 5,950; in 1954, the number was 32,255—an increase of more than 440 percent. During the same period, the average monthly consumption by domestic customers

jumped from 133 kilowatthours to 313 kilowatthours. That was an increase of more than 135 percent and it reflects the great increase in the use of electrical appliances by domestic customers—washing machines, dryers, refrigerators, ironers, radios and television sets, and all the others in the growing list of new electrical equipment.

While great numbers of Hydro customers were being added in the domestic field and the average monthly consumption was increasing at so great a rate, it is significant that the cost of electricity to Scarborough's domestic customers actually decreased—from 1.45 cents per kilowatthour in 1944 to 1.37 cents in 1954.

Industry and commerce always follow the power lines, and in Scarborough Township industrial and commercial development go hand-in-hand with the increase in housing which accounts for the ever-increasing number of domestic customers. There were 385 commercial customers in the township in 1944; in





△ PACING the increasing demands of its customers, Scarborough P.U.C. moved from these modest quarters (right) into the handsome building (above) in Oct., 1953 ▷

1954, as previously noted, there were 1,457—an increase of 278 percent. The number of power customers increased by 746 percent in the same period.

The increase in the average monthly consumption by commercial and power customers is equally spectacular. In 1944, the figure for commercial customers was 303 kilowatthours; in 1954, it was 1,396—an increase of 361 percent. The figure for power customers in 1944 was 9,854; in 1954, it was 22,864—an increase of 132 percent.

Statistics alone, of course, cannot tell the complete story of the Scarborough achievement; cannot give a detailed account of the foresight of its municipal leaders, nor describe the great efforts made to meet the challenge of the township's giant strides into the future. Foresight, initiative and the ability of the local public utilities commission to meet demands, particularly demands for power, made the Scarborough story the reality that it is today.

Spread out along eleven miles of Lake Ontario's most picturesque shore line, Scarborough offers a rural atmosphere with all the financial advantages and conveniences of a major urban centre. This, no doubt, accounts for much of the home-building activity in the township: residential building permits valued at close to \$60 million were issued in 1954, compared with permits totalling less than four and one half million dollars in that classification issued in 1947. Commercial and industrial building permits also increased greatly, with the years 1947 to 1954 showing a total of close to \$50 million for these categories.

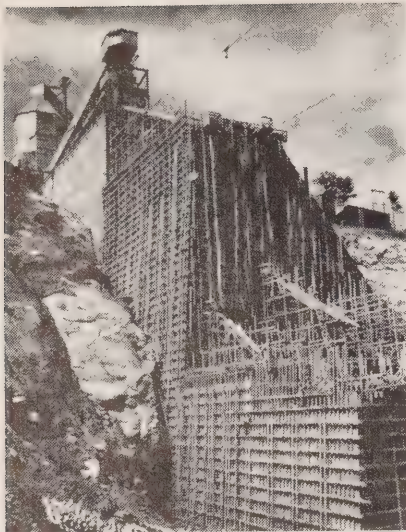
As a result of this expansion, Scarborough's population climbed from 24,140 in 1944 to 95,706 in 1954. And the Scarborough utility expanded right along with the township, adding 87 miles of transmission line and 14 substations during



the 10-year period. Today, the township is served by a total of 20 substations, four of which were constructed in 1954 at the cost of nearly \$300,000. The overall expansion in the district is reflected by figures showing that the December peak load increased from 4,142 kilowatts in 1944 to 66,294 kilowatts in 1954—a tremendous jump of 1,500 percent.

The importance of power in Scarborough's expansion was given concrete recognition in October, 1953, when the township commission opened a modern, three-storey building to serve its Hydro and water customers. Opening of the building, of course, revived memories of the

*(Continued on page 32)*



# PATHWAYS

Chapter V — Part I

## CONSTRUCTION OF A HYDRO-ELECTRIC DEVELOPMENT

by

J. H. Jackson and K. J. Blakeman\*

THE responsibility for keeping the supply of power ahead of demand has been vested in Hydro's Planning Division. Theirs is the problem of deciding when and where a new source of power is required and the Engineering Division is responsible for preparing designs, economic studies and finally design drawings. During the planning and design stages, the Construction Division undertakes comparative estimates to assist the Engineering Division in reaching a decision on the most economic location.

### Estimates

When approval has been given to proceed with a development, and in cases where the Construction Division is designated as the construction agency, the first step is the preparation of a performance estimate. This estimate is completed by using the latest design drawings, while the availability of a progress schedule is an additional advantage. The preparation of this estimate is a joint effort of many sections of the Construction Division. The estimating group heads up the operation and obtains assistance from the Construction Design and Planning Engineer, the Plant Engineer, Cat-

ering Superintendent and finally the construction project engineer who will co-ordinate the construction effort from Head Office.

While the estimate is being prepared, engineers from the Construction Division visit the proposed site and decide on the location of the camp and plant facilities, and the construction methods that are to be employed.

### Organization

The field organization is the next consideration as it is imperative to have a responsible person at the site as soon as possible. Usually the general superintendent is chosen first. Then he assists in the selection of his key men. Other groups within the Commission, such as the Accounting Division and the Personnel Branch are consulted for the appointments of their respective representatives. In recent years it has become customary to appoint a project manager on larger jobs to co-ordinate the work of the various divisions and to provide someone at the site with full authority. This type of organization is especially effective where a number of contractors are employed as well as Hydro's own Construction Division, such as the Sir Adam Beck-Niagara Generating Station No. 2 project.

With a few exceptions, most of

Hydro's recent developments have been located in areas remote from civilization. This means that access to the site must be provided and some form of construction power brought in before actual construction can begin.

The provision of access to a site entails many varied problems in moving personnel, materials and equipment.

Southern Ontario, for example, has an adequate network of roads and railroads making the problem of transportation less complicated than in the north. The great density of population, however, creates problems in rehabilitating persons living in the vicinity of the project who may be affected by new water levels. Road construction is often necessary to avoid interference with and over-extensive use of public roads. In some instances, public roads and railways must be relocated, while, in other instances, railroad spurs and sidings must be built to facilitate construction requirements.

In contrast to the south, by virtue of its smaller population, rocky terrain and low winter temperatures, northern Ontario presents additional problems in gaining access to the site. Of the available means of transportation, namely, roads, rail-

*(Continued on page 8)*

\* (J. H. Jackson, Construction Engineer, and K. J. Blakeman, Design and Planning Engineer, Generation Department, Construction Division, Ontario Hydro).



# O POWER



AT many Ontario Hydro projects, particularly in northern Ontario, building of permanent access roads, similar to this 13-mile route to the Manitou Falls Generating Station (English River) project, is a necessary preliminary before actual construction can begin on the development.



△ ANOTHER initial step is the provision of power supply facilities. During work on the two-unit phase at Hydro's Pine Portage Generating Station this line carried power to the large construction camp site on the Nipigon River.



roads, waterways and air, a combination of any or all four methods must be employed in many instances. Construction of additional roads sometimes can be delayed or carried out simultaneously with site clearing. In such cases, materials and equipment may be transported by water or air. A typical northern road may require cutting through a forest or rock, filling low stretches and bridging.

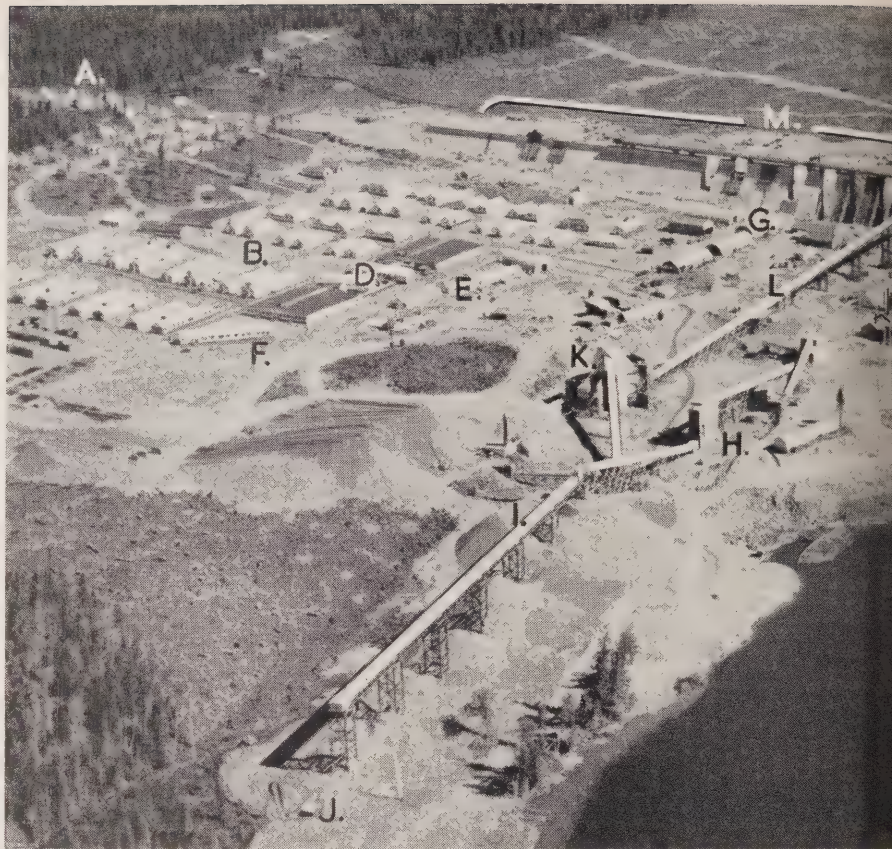
When conditions, involving terrain, weather, plant and material, are not satisfactory for proceeding with a permanent construction road, it is necessary to resort to construction of a winter road before starting a permanent access route. The purpose of the winter road is to gain access to the site and admit the equipment necessary for starting camp construction, as well as to allow work on the proposed permanent road to be carried out from both terminal points. As its name implies, the winter road is built before or during the freeze-up period, and maintains its stability throughout the winter months. It is usually located in the proximity of the proposed permanent road. To date, the Commission has had occasion to build several winter roads, one of them extending for some 50 miles.

With temporary access provided, some form of construction power must be provided. This can be in the form of a diesel-generator established at the site, or a transmission line from the nearest source of power. This is a matter of economics, and, in some cases, it is financially sound to build the permanent transmission line to the site before construction commences.

With access and power provided, it is now necessary to get men "on the ground" to commence clearing operations and construction of camps.

### Camps

The requirements of a camp for construction purposes will vary with its location. If a project is located close to a major community, the



amount of camp accommodation required will be substantially less than in the case of a project located in the heart of the bush. Similarly, the other facilities necessary for a camp in a semi-urban location will not be as extensive as those required for construction at a remote development site.

A construction camp for a bush project will normally comprise bunkhouses for hourly-paid staff, accommodation for male and female staff, cafeteria with food storage and preparation buildings, hospital, school, and a recreation hall including an auditorium. In addition, a small housing colony may be set up to cater to the needs of the families of senior staff. In recent years, well-equipped trailer park facilities have been provided also for staff and construction employees. On current projects, there is a trend towards replacing staff colony houses with large trailers for families of up to

four people. For a camp located adjacent to an urban community, the size of the camp may be substantially reduced and such facilities as hospital, school and recreation hall may be on a reduced scale, or even eliminated.

In either case, whether the camp be located near a municipality or in the bush, careful consideration will be given to its location relative to the work to be carried out and to the local topography. The buildings provided will, in all cases, be designed to provide the maximum amount of comfort for the occupants commensurate with the needs of economy. At present, the type of bunkhouse used will not vary to any great extent regardless of the location of the project. For the majority of the projects warranting a camp installation, a bunkhouse to house 80 men has been standardized and this is arranged in the form of an "H" with the sleeping accommoda-





◁ **BUILDINGS** and other structures associated with construction for the initial installation at Pine Portage Generating Station: A—Housing colony for senior staff and families; B—Accommodation for camp staff and construction or hourly-paid employees; C—Recreation building; D—Cafeterias; E—Construction and administrative offices; F—Hospital; G—Workshops area; H—Crushing and screening installations; I—Aggregate conveyor; J—Reclaiming tunnel terminal; K—Concrete mixing plant; L—Concrete conveyor; M—Main dam; N—Powerhouse site; O—Tailrace excavation, and P—River diversion during construction.

Sewage disposal and water supply arrangements are other aspects in the planning of a construction camp, which require careful consideration. Usually, water supply is designed to be taken off from what will ultimately be the headpond of the development, and sewage disposal, wherever possible, is arranged to discharge on the downstream side of the development after first passing through a suitable septic tank.

### Standard Type

All the buildings comprising a construction camp have a standard type of construction. This consists of a double timber floor supported on timber post footings and 4" stud walls having a gyproc lining on the inside and "ten-test" sheeting on the outside. The exterior "ten-test" is usually treated with white masticote to render it waterproof. It has also been found economical to insulate the walls on any camp building which is going to withstand two winters or more. The roof of these buildings is normally of timber frame construction with aluminum sheeting. Throughout the construction of all the buildings, either 2 x 4, or 2 x 6 material is used, wherever possible, to reduce to a minimum the number of sizes of timber required. This also helps to keep down the cost of the camp, as sizes above these increase rapidly in price.

At many Ontario Hydro projects, the recreation building has been an important feature of the camp and every effort has been made to make the facilities provided as comprehensive as possible. Thus, the recreation hall will normally include such things as bowling alleys, pool tables, badminton court and space for table tennis, cards and group-watching of television, when the camp is within range of a transmit-

ter. The auditorium will also be designed to provide facilities for movies, dances and other social functions. Outdoor recreation in the way of hockey, baseball and tennis are also provided for under normal circumstances.

### Shop Installations

On a project of any size, certain shop installations will be required. These normally will comprise the following:— machine shop; carpenter shop; vehicle repair garage; blacksmith and welding shop; boilerhouse and compressor house. The size of each of these shops will vary in proportion to the size of the project being undertaken. On major projects such as the Sir Adam Beck No. 2 development, the machine shop will be a substantial building probably incorporating an overhead moving gantry crane and equipped to undertake major repairs of any nature on items of construction plant and equipment. Also the shop will be capable of carrying out a wide variety of fabrication work, both mechanical and structural. The carpenter shop will be equipped to take more of the special carpentry work, exclusive of millwork, required on the job. An erection platform is usually located adjacent to the carpenter shop for the draft tube formwork and intake formwork where required.

### Construction Plant Installations

Under this heading are included such installations as crushing and screening plant, aggregate handling plant, concrete mixing plant, and the installation necessary for handling concrete from the mixing plant to the formwork. When a project is first undertaken, a considerable amount of study is devoted to deter-

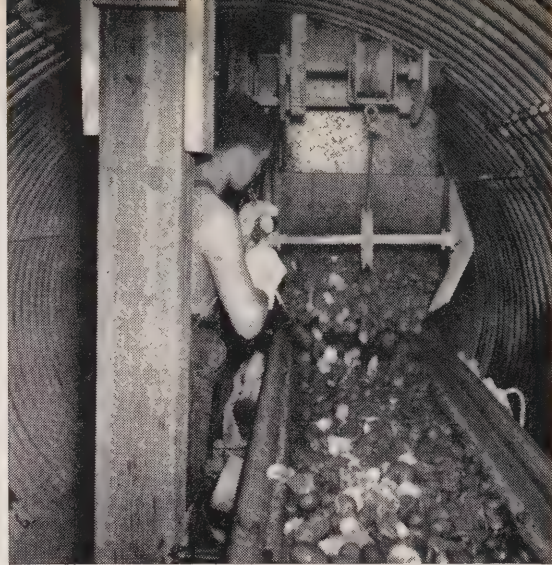
*(Continued on page 10)*

tion in the two long legs of the "H" and the ablution facilities located in the connecting portion of the "H". On earlier projects, it was the practice to heat these buildings by unit heaters and high-pressure steam. However, in some recent projects such as the Manitou Falls development, a new system of circulating, hot-water heating has been introduced with substantial savings in money and a considerable improvement in the heating of the buildings themselves. Usually the heating installation of the whole camp is designed so that buildings are grouped to be serviced by one or more small boiler houses. For example, four bunkhouses are normally heated by one 60-horsepower boiler, which provides circulating hot water under pressure. The heating of the cafeteria is usually by high-pressure steam because the cooking installations are also operated by this method.





CONSTRUCTION of a Hydro plant also involves such installations as this aggregate handling equipment. Note the material dropping from the conveyor to the stock pile.



IN this reclaiming tunnel under the stock pile, the aggregate is conveyed to mixing plant.

mining the best layout for these installations and also the best type of installation.

A number of factors affect the final layout for the production of concrete. For example, if the source of supply of the aggregate is located at some distance from the project, it may not be advisable to have an extensive aggregate stock piling and reclaiming installation adjacent to the mixing plant itself. Under such circumstances, the aggregate may be trucked to the site and deposited in various stock piles located so that the aggregate can be carried into the mixing plant by means of a crane and clam bucket. On the other hand, it may be essential, owing to the location of the site and any attendant difficulties connected with winter operations, to maintain large stock piles of aggregate close to the mixing plant itself. In such cases, a system of overhead conveyors or travelling stackers for depositing the aggregate may be necessary and a reclaiming tunnel and conveyor may have to be located beneath the stock piles.

The size of the mixing plant required is always an item for considerable discussion on a major project. Usually it will be determined by the rate at which concrete has to be poured, together with the maxi-

mum amount necessary in any one single pour. To handle the concrete from the mixing plant to the forms, a wide choice of method is available. Here again, in the planning stages of the work, several studies will be made to determine the most economical and suitable method of handling the concrete, bearing in mind the size of the project and the local topography. On Hydro projects in the past, the concrete has been placed by cranes and buckets, cableways, overhead conveyors and concrete pumping machines. Each of these methods have their particular merits which are applicable to a particular set of circumstances. However, each method is, in itself, capable of considerable variation in the way it is laid out and economic studies are normally made to determine the final arrangements.

On projects carried out by the Commission during the past 15 years, concrete mixing plants have been built with an output capacity of anything from 50 to 200 cubic yards an hour, and are representative of some of the largest concrete mixing installations ever to be built in Canada.

### Stores Organization

One aspect of the camp and plant installations necessary on a major

project, that has not yet been mentioned, is the stores organization. Vast quantities of stores have to be handled for any major project, and an essential part of the project organization is an efficient and adequate storekeeping system. Provision has to be made for both construction stores and permanent stores. Construction stores are those stores which are used incidental to the construction of the permanent structure and, which, may or may not be recoverable for use on other projects. Permanent stores are those stores which form part of the completed permanent structure or plant installation. Usually the storekeeping organization is set up to take care of these two different types of stores independently. Thus, a large warehouse will be necessary for containing construction stores and an additional building is usually required for housing the permanent stores until such time as they are incorporated in the permanent structure. Such things as turbine and generator parts have to be kept in covered and heated storage and require careful handling and records to ensure that nothing is lost or damaged.

The construction stores organization calls for a system to look after the day-to-day requirements of the





△

MIXING plants produce different types of concrete for various purposes. Proper mixture of aggregate and cement is controlled by a single operation at this "push-button" panel.

ONE of two completely automatic concrete mixing plants used at Hydro's new Niagara project for the manufacture of some 3,500,000 tons of concrete required in the various structures.

▽



various construction crews on the project. Such items as nails, nuts and bolts, pipe-fittings, and a thousand and one articles which are required incidental to the construction of a big project, pass over the counter in the construction stores every day.

#### Unwatering and Diversion

As the foundations of the powerhouse itself, and possibly other structures, will be below the existing water levels, unwatering of the areas involved must be undertaken before actual construction can proceed. This is accomplished by means of cofferdams — structures built to exclude water from an excavation so that work may be done in the dry.

A typical cofferdam for powerhouse excavation purposes is built of rock-filled timber cribs sheeted

*(Continued on page 12)*





TYPICAL cofferdams at the Manitou Falls project consist of rock-filled timber cribs. These structures permit powerhouse and main dam construction to proceed "in the dry." Meanwhile the river flow is passed through temporary openings in one section of the main dam, right.

on the outside. It is placed at such a distance from the structure as to allow all excavations to be carried out in the "dry" after the shut-off area has been pumped out. In the past few years, the cellular steel type of cofferdam has been used quite frequently. It consists of interlocking steel sheet siding driven around a circular template to form a complete cell. The individual cells are connected by two diaphragms of sheet piling. The cells and diaphragms are then filled with an easily-removable granular material.

On certain excavation jobs, it sometimes suits conditions to utilize the natural bank of earth or rock along the shore line. Behind this protection, the work is carried out, and when the area is flooded after the completion of the structures, the bank may be removed from under water.

When the permanent dam, which will contain and maintain the head of water for power purposes, has to be built across the river, some method has to be devised to handle the

flow of the stream while construction is in progress. Each particular site suggests its own best and most economical arrangements.

One practice is to project cofferdams from the shores to embrace the areas which must be unwatered while the dam is being built. First of all, a cofferdam in the shape of a three-sided figure, making with the shore line a rough square or rectangle, is built out from one side of the river. When the area thus contained has been unwatered, a section of the dam is constructed. The cofferdam is then removed, a similar cribwork is projected from the other side of the river, and under its protection the remaining section of the dam is completed in the dry. Openings, of course, have been left in the first section of the dam to provide for the diversion of the river flow while the second section is under construction. When the whole

work is completed, these openings are closed by gates or stop-logs and filled up behind with concrete.

In some cases, the problem of dam construction may be solved by the diversion of the entire river through a concrete conduit built along the shore. Cofferdams are built to effect this diversion which permits the whole site of the dam to be unwatered at one time. After the dam is completed, the conduit is closed off by gates and filled behind with concrete. In the case of a low river flow, an open flume may answer the purpose of a conduit.

Still another method of handling river flow is by the excavation of a tunnel in the river bank. Into this tunnel the stream is diverted. When the dam is completed, the tunnel entrance is closed by gates, and a short section behind is filled with concrete.


*(To be continued)*





# ODE TO A POLE

by FRANK TRIPP

 THERE is a pole outside our summer place that we once felt very unkindly toward. If I had dared to do it, there was a time when I would have had it cut down. Then we discovered that it is possible to acquire a friendly feeling even for a pole.

Any direction one looks from Fanny's wonderful flower garden the view is something like Eden must have been, except toward the quaint road that winds down the hill. That is where the pole stands.

It is just outside our wall and it rises into the aged elms and beautiful maples that were there long before it came. I don't know why it is, with so many other ways to look and such wondrous things to see, that I never fail to look toward the pole.

Since we've come to admit that it has to be somewhere, there is no better place than where it stands. The road is at the back of the house, which faces Seneca, and Fanny has bordered the lawn with flowers that I can't name and don't understand, except to know that they're her heart's delight and are beautiful.

There it stands amid as glorious a scene as nature ever painted. In spite of the pole, man's effort to keep it neat, in comparison to its surroundings, it is an ugly thing. There are crossarms, electric and telephone wires and a sizable transformer at its top.

How we came to feel more kindly toward the intruder came about through realization of what we'd do if it wasn't there. It was an interesting muse that brought us to our senses and conclusion that the pole is the reason that we live six months of the year in one of God's garden spots, away from city hum, bustle, heat and gas fumes.

Before the pole came, back in 1841 when our house was built, the sturdy pioneers who lived there had the same deep well of pure cold water that we have now. They had a pump in the kitchen sink, which was pretty modern, for most pumps then were out in the yard.

They heated their water over a wood fire in the kitchen range; after they had gone to the woods, brought in the logs and cut the firewood. They bathed Saturday nights in a washtub, moved into the kitchen; hustled upstairs to a frigid room, crawled into a deep feather bed under two feet of heavy crazy quilts and were warm by morning.

Our water, fuel, baths, refrigeration and telephone come off that ugly pole. It pumps our water and delivers it to a dozen spots all over the place. It heats it to any temperature we like and sends it to our bathrooms, showers, electric dishwasher and washer. It sends heat to electric blankets on our beds. It runs our oil burner, ironer, freezer, the tools in my shop, even our clocks.

Where the old ice house stood is a pretty flower bed. The refrigeration that the pioneers cut from frozen ponds and stored in sawdust flows through those wires that we used to wish were not there. So do the doctor's calls.

We found the old kerosene drum in the cellar and some lamps and oil lanterns. The time once spent cleaning, trimming and filling them, we spend lamenting that the pole is there. All the light we want, anywhere we want it, comes off that pole. I'll bet we'd bellyache more about an unsightly woodpile than we do about the pole; for we not only have no woodpile, we haven't even got a back yard.

It's all lawn and flower beds now. All on account of the pole. But for the pole there'd be an ice house, a woodpile, an ash heap. There'd be wash tubs hanging on the back porch. There'd be a Chic Sale and a path down which to wander with a lantern on a chilly night—and we'd have a household of rheumatics. No, we wouldn't, because but for that pole we wouldn't be there. We couldn't take it like our fathers did.

So now we can go out and look at the pole and it doesn't seem ugly at all, when we think of all the comfort and convenience that comes off of it, contemplate the more unsightly things that it replaced, the ease and hours to complain that it brings us.

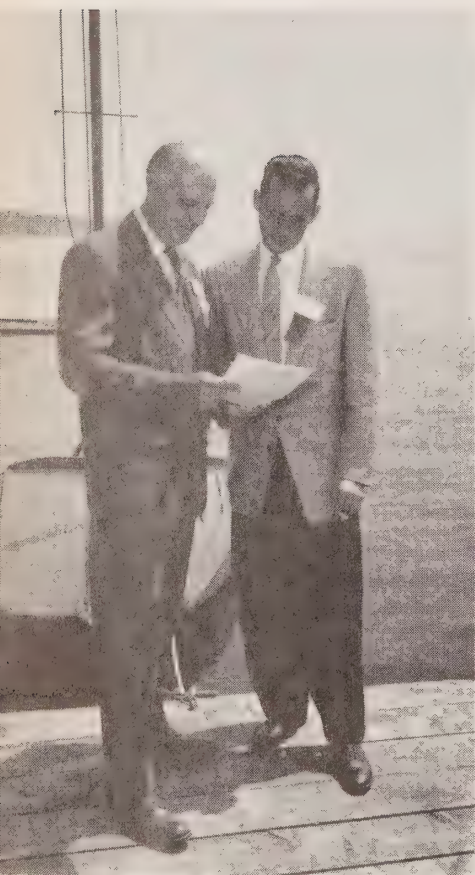
Just let somebody try to harm that pole. (Copyright, 1953, General Features Corporation.)

# BILLS & BUDGETS

**Fourth annual Eastern A.M.E.U.**

**Conference at Gananoque**

**features wide range of topics**



△ ST. LAWRENCE River forms a background for L. A. Vradenburg, Ontario Hydro, left, as he discusses his address, "Why Budget?" with D. B. Michie, Secretary of Mimico P.U.C.

THE St. Lawrence River provided the scenic background—and possibly, because of its current associations with power and progress—some of the inspiration for the highly successful fourth annual Accounting and Office Administration Conference of the A.M.E.U.'s Eastern Division, held June 16-17 this year at Gananoque.

Over 100 delegates participated enthusiastically in the sessions, which included interesting and informative addresses ranging from budgets to the collection of final accounts. Voting unanimously to hold next year's sessions in the same location, the delegates affirmed their satisfaction with the value of the conference.

Registration started Thursday afternoon (June 16) and at an evening banquet, the delegates were given an official welcome by Gananoque's Mayor A. Gerald Woodley. That same evening, they also heard an address by W. D. T. Atkinson, Principal of Glebe Collegiate, Ottawa, and inspected the display of business machines set up in the lobby of Gananoque Inn, the conference headquarters.

Buckling right down to work early Friday morning, the large group of utility accountants and office administrators got off to a good start when W. H. "Bill" Gibbie, accountant with the Oshawa Public Utilities Commission, outlined his utility's approach to the "oft-time" harassing problem of collecting final accounts.

Presenting practical solutions to many problems, such as collections from customers who move without notice, Mr. Gibbie emphasized the importance of what he termed a "good public relations approach."

"This method is important," he continued, "since the awkward customers to collect from will, in most cases, be those who have moved some distance and an approach involving good public relations may be the only one to use."

The speaker suggested the following methods of collecting bills from this type of customer:

1. Rendering the final account promptly and to the correct forwarding address.
2. Forwarding a letter, with the account, explaining the disposition of the deposit, if any, and express-



W. H. "BILL" Gibbie, Accountant, Oshawa P.U.C., discussed methods of collecting final Hydro bills. ▷



ing the hope that payment will be made in time to take advantage of the discount.

3. Sending a further letter, if necessary, pointing out how failure to remit the payment promptly can affect personal credit ratings.

4. Should all this be ineffective, the only recourse is to ask the co-operation of the local utility or Hydro office serving the customer in his new location in collecting the bill.

### Reciprocal Collections

The Oshawa accountant described as "excellent," the reciprocal arrangement now existing among the various utility and Hydro offices in the collection of accounts from relocating customers, and said experience has shown that a call from a utility collector in the customer's new location is usually sufficient to take care of payment of arrears.

The speaker noted that, to his knowledge, the Oshawa Commission has never failed to collect an account for another municipality, and, on several occasions, has collected simply by adding the arrears to the bill sent out from the Oshawa office.

Briefly discussing the methods used by his own office in the collection of accounts under differing conditions, Mr. Gibbie acknowledged that varying circumstances in other municipalities could require a somewhat different approach to en-

sure success. Concluding, he said it has been suggested that all municipalities and Ontario Hydro be approached to endorse a resolution to the A.M.E.U., calling for the establishment of legislative authority to empower municipal commissions and Ontario Hydro to enforce collection of final accounts on behalf of other utilities in the same manner as their own.

Turning from the question of collections to the problem of spending utility monies, L. A. Vradenburg, Accountant, Eastern Region, Ontario Hydro, answered the question "Why budget?" by telling the delegates that the budget function is perhaps the best means of assuring the most economical supply of power to customers.

"Businesses which plan their operations properly," he said, "rarely ever find themselves in trouble because they are in a position to foresee problems and to take the necessary steps to adjust their operations to existing conditions quickly and easily. The general fundamental purpose of the budget, therefore, is to chart the most profitable course, and to assist in holding your business on that course."

### Comprehensive Budget

Outlining many particular advantages of a comprehensive budget, Mr. Vradenburg said that it promotes early and careful study of

utility problems by management before definite decisions and action are necessary.

In the public utilities field, he continued, the comprehensive budget can be conveniently broken down into four major divisions: (1) the construction budget; (2) the operating budget; (3) the materials and supply budget, and (4) the cash budget.

Clarifying these divisions, and describing their value in the overall budget picture, Mr. Vradenburg also noted briefly the importance of having every employee participate in the actual functioning of the budget.

"It has been my observation," he said, "that most of us derive a great deal of job satisfaction from the completion of an assignment, which has been directed to us in a proper manner, and I believe that this factor can be a foundation stone for successful budgeting. The budget officer and his staff must do a selling job, so that everyone gets into the act and becomes a real part of the program, having been advised and encouraged in the aims and general policy to be followed."

Copies of a special article on budgeting, provided by Mr. Vradenburg, and of Mr. Gibbie's address, were quickly taken up by the delegates, who displayed keen interest in the subjects dealt with by the two speakers.

### Pensions

Bertram Merson, Chairman of the Toronto Hydro-Electric System, was the guest speaker at the noon-hour luncheon following Friday morning's active business agenda. Mr. Merson, who is the Secretary-

*(Continued on page 16)*



KNOWN as Canada's "Mr. Limerick," guest speaker W. D. T. Atkinson, Ottawa (seated), demonstrates his versatility in composing rhymes for John M. Campbell, Gananoque, centre, and A.M.E.U. President H. A. Howard.





Treasurer of the four-man Municipal Hydro-Electric Pension and Insurance Committee, in a strongly-worded address urged further adoption by municipal systems of the supplementary plan brought into being in 1951. He said that while 31 municipalities have, so far, taken advantage of the new supplementary plan, he believed that many more should be joining it.



△

BEAMING appreciation is Ontario Hydro's retiring Municipal Accounting Supervisor, D. J. "Mac" McAuley, right, who was presented with a handsome barometer on behalf of the A.M.E.U. Accounting and Office Administration Committee sections by veteran Manager-Secretary C. S. Walters, Napanee P.U.C.

The other members of the committee of which Mr. Merson is a member are: Chairman P. R. Locke, Commissioner, St. Thomas Public Utilities Commission; Vice-Chairman R. S. Reynolds, Manager of the Chatham Public Utilities Commission, and G. R. Davis, General Manager of the Kingston Public Utilities Commission.

"I have nothing personal to sell," Mr. Merson declared, "but I believe that the supplementary plan we now have is worthwhile and is for the benefit of utility employees across the province." The speaker urged those present to "get out and work for the adoption of the supplementary plan by your municipality, or at least see to it that you enquire about it."

A surprise feature of the conference was a presentation to D. J. "Mac" McAuley, retiring Municipal Accounting Supervisor, Ontario Hydro.

On behalf of the Accounting and Office Administrative sections of both the Eastern and Western Divisions, A.M.E.U., the venerable Manager-Secretary of the Napanee Public Utilities Commission, C. S. Walters, presented Mr. McAuley with a handsome barometer, and expressed the best wishes of all those in the municipalities whom "Mac" McAuley has helped and

guided during his many years of service. Mrs. McAuley also was the recipient of a bouquet of roses from Miss Tena Harvey, Secretary of the Perth Public Utilities Commission.

There was the spice of high good humor in both Mr. Walters' presentation and in Mr. McAuley's acceptance of the gift. Laughing delegates, in fact, were reminded of the witty dissertation on the subject of limericks delivered the evening before by Principal Atkinson, of Ottawa's Glebe Collegiate. An expert on the subject, Mr. Atkinson, who is unofficially known as Canada's "Mr. Limerick," traced the history of the poetical 5-line puns and liberally larded his talk with samples.

Mr. Atkinson might have approved the following limerick, dedicated by "Ontario Hydro News" to the Conference:

*There was a big group at St. Lawrence*

*Which viewed waste of time with abhorrence*

*They gathered all bent*

*To work with intent*

*And managed to do it—in torrents!*

It was not all work at Gananoque, though. The delegates were entertained at the Thursday evening dinner, for instance, by a talented singing foursome known as the Bachelors' Quartet, from Carleton College, Ottawa, and among the songs rendered by this group was their version of "Davy Crockett," a composition extolling the virtues of Samuel "Sam" Champlain.

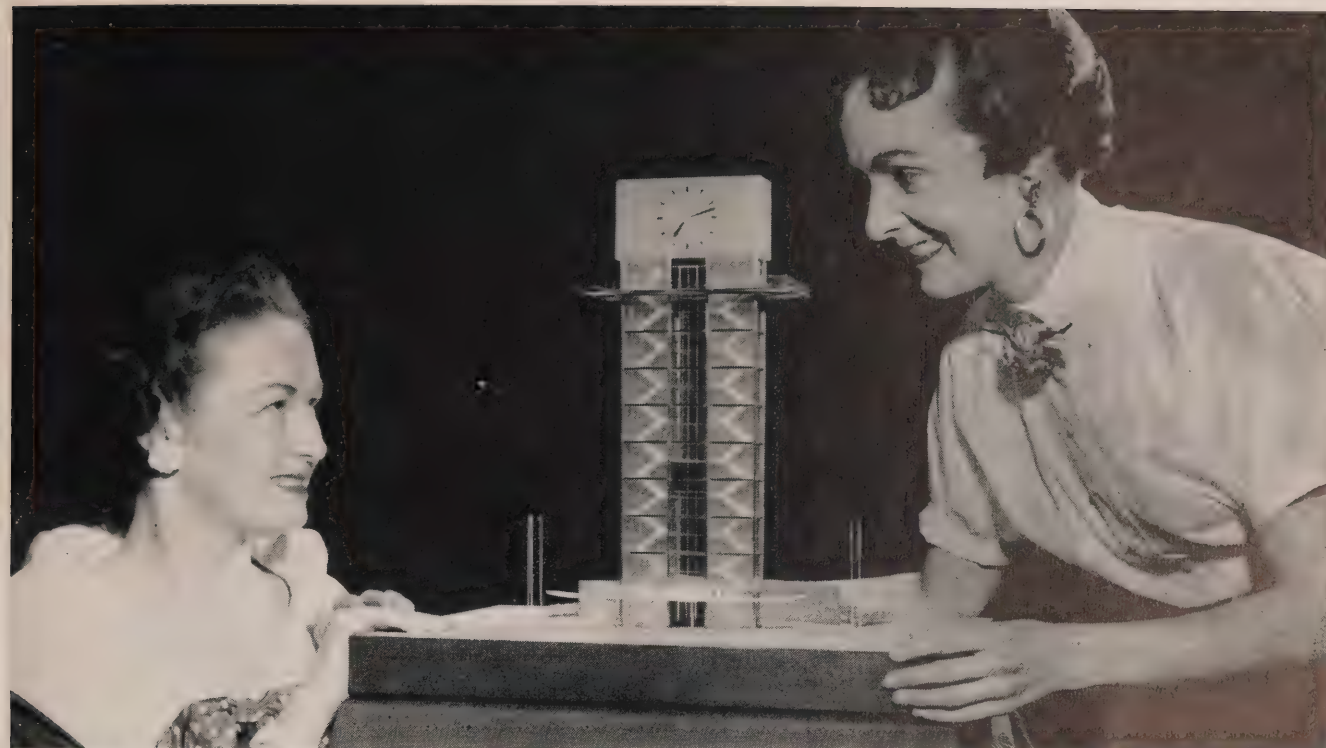
Most of the delegates, too, managed to find enough time to enjoy a boat ride among the Thousand Islands, arranged through the courtesy of John M. Campbell, General Manager of the Gananoque Electric Light and Water Supply Co. Ltd.

—by A. A. Jones.



◀ DELEGATES, left to right, N. J. Douglas, Smiths Falls; Roy Charles, Ottawa, with Bobby Douglas, George Phillips, Mrs. Douglas, and E. V. Dyke, all of Smiths Falls, admire the smooth functioning of a billing machine operated by Miss W. A. Hamilton.





ATTRACTIVE Shell Oil Company employees, Helen Merklinger, left, and Norma Sweet, examine a model of the Shell Tower, a 120-foot structure now being erected at the C.N.E. grounds.

## LIGHTED LANDMARK

**T**ORONTO Hydro-Electric System will have a new and welcome customer at this year's Canadian National Exhibition. The new customer, The Shell Oil Company of Canada, is changing Toronto's waterfront skyline by the erection of its attractive nine-storey Shell Tower at the C.N.E. grounds, 400 yards west of the Princes' Gate.

With an overall height of 120 feet and an observation platform at the 90-foot level, the new Shell Tower will be a completely transparent structure, built entirely of steel and glass to provide maximum visibility from all levels within the tower and to create a striking illumination effect at night.

The unique structure is to be located on an elliptical-shaped paved

plaza, approximately 100 feet long and 70 feet at its widest point. With a reinforced concrete foundation, 12 feet in depth, the tower will be supported by eight vertical, structural steel columns, and will contain 100 tons of steel and approximately 9,000 square feet of glass.

### Permanent Beacon

Brilliant exterior and interior lighting equipment will make it a permanent beacon for motorists and nearby lake shipping. Each of the eight vertical steel columns will carry a continuous lighting truffer containing slimline fluorescent fixtures to provide outline illumination, while the interior will be lighted by incandescent lamps.

An elevator will carry 25 passengers to the observation balcony

in 30 seconds where guests will have an unobstructed view of the waterfront, the Toronto Islands area, downtown district, the C.N.E. grounds and other points of interest. Visitors with "elephobia" can climb the 18-flights of stairs to the 10-foot wide balcony if they prefer 144 steps to a fast ride. Shell officials will, however, suggest the elevator for convenience sake and because it permits full control over the number of people on the balcony at one time.


### 11-Foot Clock

Surmounting the observation plaza will be an 11-foot electrically-operated clock with three-foot numerals. The remotely-controlled timepiece will be visible for a half-mile, providing precise time for some 65,000 motorists, who use the Lakeshore Road on the average working day.

Ingeniously designed and lighted, the \$125,000 Shell Tower proudly takes its place among the Queen City's dominant landmarks ■

# CORN IS NO JOKE

## Modern electrical application promotes thriving agricultural enterprise



**C**ORN is not just an ingredient of comedians' jokes.

It is also one of the grains that has served mankind for hundreds of centuries. So important was corn in the economy of the ancient Egyptians that archaeologists have found it in Egyptian tombs, left presumably by relatives and friends of the deceased to sustain the traveller on his journey into another "land." There are numerous Biblical references to corn, indicating the part it played during that period of history.

Its use seems to have been common among the peoples of many lands, even in more recent times. When the white man first came to North America, he found the Indians growing maize or, what is sometimes known as "Indian corn."

Today, corn has many everyday uses, which, perhaps, are not always too apparent. Besides its popularity as a canned food, it is used in breakfast cereals, as livestock feed, and in the manufacture of syrup. It is employed extensively in the manufacture of starch, paper coatings, textile fillers, cooking oils, the preparation of antibiotics, etc. And who, once having experienced them, can forget the tantalizing aroma of johnny-cake and syrup, or the inef-

fable delight of fresh, tender corn-on-the-cob?

Corn has become an increasingly important crop in Ontario. Production is three times what it was in 1934, and almost double in 1944. In 1934, Ontario farmers grew 6,797,000 bushels of corn. Ten years later, this had increased to 11,040,000 bushels. Last year, in spite of extremely bad harvesting conditions, the corn crop of the province totalled 21,920,000 bushels.

To be successfully marketed today for many of its uses, corn must have its moisture content reduced. This is a major problem because corn is some 30 percent water. If it is not dried out sufficiently, it is susceptible to rot and mould. Experience of corn growers, and those using it in various manufacturing processes has shown that this moisture content should be reduced by about half.

In natural corn-drying, the farmer places the shelled corn in huge, open-air cribs. While this method is reasonably satisfactory, it is entirely dependent upon the vagaries of the weather and corn may take weeks and even months to dry sufficiently. In addition, there is a considerable loss, due to the depredations of birds and rodents as well as mould



# ERE

by HORACE BROWN

caused by insufficient air getting through the corn cribs.

All these factors made it important to find some mechanical means of kiln-drying.

Experiments conducted by agricultural colleges, universities and experimental stations in many sections of this continent, indicated that exposing shelled corn to some form of heat, coupled with an air blast, would dry this important grain satisfactorily. This method, it was found, also reduced the drying-time to a matter of hours, instead of the weeks or months required by natural drying.

Then electricity came to the aid. Manufacturers devised electrically-operated equipment that made corn-drying automatic. Now, an increasing number of such installations mean money in the farmer's pocket.

A man who has put this electrical application to actual use for the farmer is Glenn C. Brodie, of Melbourne, Ontario, some 20 miles west of London. Mr. Brodie felt that individual corn-drying installations would be too great an expense for the average farmer. He reasoned, however, that the farmers of his district would be willing to patronize a project that gave them a

*(Continued on page 20)*



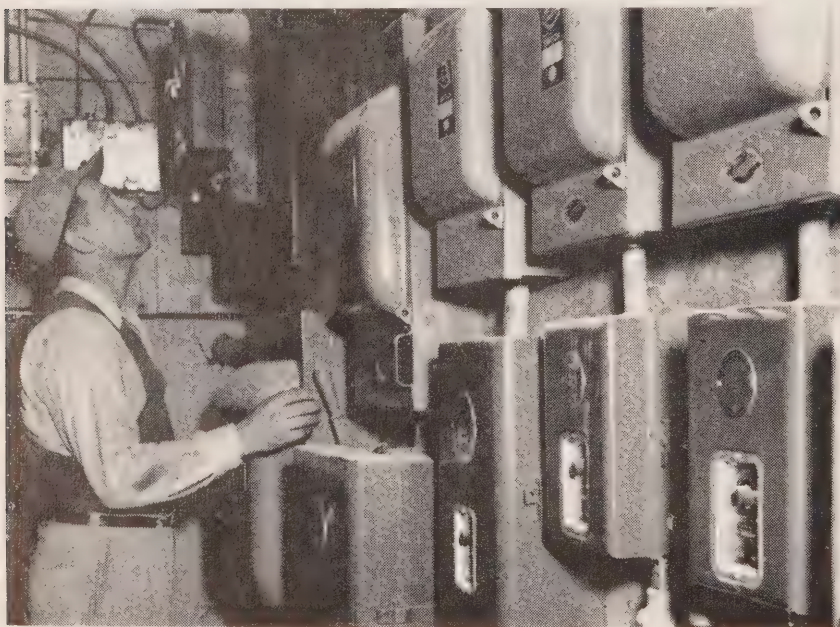
STRATHROY trucker was slightly nonplussed when he saw his three-ton truck, loaded with corn, raised by a hoist (above). The hoist, operated by a three-horsepower motor, dumps the corn into an electrically-operated shaker (below), which conveys it to the sheller.



MANAGER Keith Hutcheson, left, with Owner Glenn Brodie, uses an electronic tester to determine the moisture content of corn by passing an electric current through a sample.



THIS Melbourne firm uses various electrically-operated machines with a total capacity of more than 200 horsepower. Here Mr. Brodie inspects a meter and one bank of switches.



chance to market well-dried corn at a reasonable cost.

To back this reasoning, Mr. Brodie invested \$35,000 in a corn-drying enterprise three years ago, in conjunction with his grain elevator at Melbourne. Now, farmers within a radius of 14 miles bring their corn to Brodie's Elevator and Feed Mill for shelling and drying. Then it is either shipped out as grain, or is sent to plants for the production of starch and other products. The enterprise has been so successful that already similar equipment has been installed at several other points in the district.

The activity has had an interesting effect upon the farm economy around Melbourne. Until the new corn-drying business was opened, that area planted a very small acreage of corn; today, it is one of the district's main cash crops. In the first year of Mr. Brodie's operation, 1952-53, only 62 carloads of corn passed through the elevator, with deliveries made from this small Ontario community to various parts of Canada and the United States and even to overseas. Last year, business had more than doubled, with 143 carloads going through the drying process. This year, due to unsatisfactory harvest conditions in the fall of 1954, the volume may be lower, but the customers are still more than satisfied with this service, which means more money to them.

#### Automatic Operation

Thanks to electricity, the shelling and drying of corn are practically automatic, requiring the attention of only two men. When the farmer's truck brings in the husked corn, the front end of the truck is attached to an electrically-operated hoist, which lifts the vehicle and allows the load to slide into the shaker. The latter, operated by a 2½-horsepower electric motor, conveys the corn to the sheller, which is, in turn, operated by a 30-horsepower electric motor, making it possible to strip kernels from approximately 1,000 bushels an hour.





△

HUGE augers convey the corn to this 55-foot high dryer where warm air from furnace (enclosed in the structure, lower right), reduces the moisture content. Chute carries grain to railway cars.



Naturally, the stripped cobs and kernels are, by this time, mixed together. But power-operated machinery finds this no problem. From the sheller, the kernels and cobs move up a bucket elevator, making 50 revolutions a minute, into a separator—a sort of fanning mill—where they are parted forever.

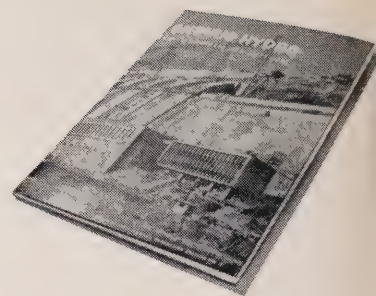
Another interesting and important electrical application is introduced at this point, when an electronic tester is used by Manager Keith Hutcheson to ascertain the moisture content of the corn before it is put through the dryer. Measuring out exactly 100 grams of the grain, he places the kernels in the tester and passes an electric current through them. A dial indicates the electrical conductivity of the corn, which is directly proportionate to the moisture content. A table of comparative measurements gives Keith the actual moisture count, and this determines the length of the drying period.

Sifting, cleaning and automatic weighing follow this test, and then giant augers take hold and convey the corn to the 55-foot high Snoblen dryer, capable of handling 300 bushels an hour. Corn, still with a relatively high moisture content, is carried by the augers to the top of the dryer. Oil-burners, operated by electric motors, provide heated air, which is blown through the corn. Three hours later the moisture is reduced by about 15½ percent . . . a process that would take Mother Nature many weeks. A chute carries the dried corn down a 47-foot drop into railroad cars waiting on the Brodie siding.

This process requires several electric motors with a total capacity of more than 200 horsepower. In fact, one room in the Brodie elevator accommodates a veritable battery of switches to control the various pieces of electrical equipment.

At Melbourne, corn is no joke, but money in the farmer's pocket, thanks to Glenn Brodie and his modern-day use of electricity ■

# HYDRO FACTS



MANY readers of Ontario Hydro News have, in the past few weeks, received copies of that important publication, "Ontario Hydro—Nineteen Hundred and Fifty-Four." This comprehensive review of information, which presents a graphic story of the Commission's varied activities last year, contains a wealth of data that should make it a valuable handbook for literally hundreds of men and women rep-



1. Q.—What was the total dependable peak capacity of the Commission's resources at the end of 1954?

A.—4,135,050 kilowatts.

2. Q.—Was this greater than the 1953 capacity?

A.—Yes, by 16 percent.

3. Q.—What was the total energy production for commercial load purposes last year?

A.—22,386,456,876 kilowatthours.

4. Q.—What proportion of this amount was produced by Commission-owned plants?

A.—Hydro's 65 hydro-electric and 6 fuel-electric generating stations produced 18,077,666,964 kilowatthours while the balance was purchased from other sources.

5. Q.—Was the net output of all resources greater than the 1953 figure?

A.—Yes, by 7.0 percent.

resenting practically every profession and vocation.

These "Hydro Facts" will give readers an opportunity to test their knowledge of the Commission's varied operations and of its achievements during 1954. The answers present, in capsule form, some of the more salient facts contained in this significant report to Hydro customers throughout the province:

6. Q.—What was the total gross revenue in the Southern Ontario System last year?

A.—\$124,831,280 — an increase of 6.2 percent on the 1953 figure which totalled \$117,567,634.

7. Q.—Did this reflect increased sales of power?

A.—Yes, in a large measure, as rates were substantially the same as in 1953.

8. Q.—What was the difference between revenue and the cost of providing service in the Southern Ontario System in 1954?

A.—Revenue exceeded cost by \$3,379,999, resulting in a credit of \$3,362,831 to the municipal utilities and \$17,168 to the Rural Power District.

9. Q.—What was the difference between revenue and the cost of providing service in the Northern Ontario Properties last year?

A.—Revenue exceeded cost by a total of \$1,453,858, resulting in a credit of \$158,101 to the cost municipalities in 1954 while the deficit account of the province was credited with the balance of \$1,210,081 after deducting \$85,676 for interest.

10. Q.—What was the Commission's gross investment in fixed assets at the end of 1954?

A.—\$1,468,558,729, against which there was an accumulated reserve for depreciation of \$154,975,237.



**11. Q.**—What were the total assets of the Commission at December 31, 1954?

**A.**—\$1,653,063,771 after deducting depreciation reserves.

**12. Q.**—How many (a) municipalities; (b) direct industrial customers, and (c) rural operating areas was the Commission serving at the end of 1954?

**A.**—(a) 375 municipalities; (b) 188 direct industrial customers; (c) 105 rural operating areas.

**13. Q.**—What percentage of the 20,111,742,526 kilowatthours supplied by the Commission was received by these three general classifications?

**A.**—(a) 53 percent by municipalities; (b) 39 percent by direct industrial customers; (c) 8 percent by rural operating areas.

**14. Q.**—How many communities were served over the facilities of the rural operating areas or rural power district last year?

**A.**—926.

**15. Q.**—How many miles of primary distribution line were there in the rural power district at the end of last year?

**A.**—42,540 miles — a net increase of 951 miles or 2.3 percent during the year.

**16. Q.**—How many miles of transmission line were added throughout Ontario last year?

**A.**—There was a net addition of 534 circuit miles of transmission line bringing the total to 15,785 circuit miles.

**17. Q.**—How many customers were served over the combined facilities of the Commission and the associated municipal systems?

**A.**—A total of 1,467,034 ultimate customers at the end of the year.

**18. Q.**—How were the customers classified?

**A.**—(a) 78.6 percent domestic-type service; (b) 10.5 percent commercial; (c) 9.3 percent farm; (d) 1.6 percent power.

**19. Q.**—What was the total number of regular and temporary Commission employees?

**A.**—The total staff declined from the 1953 total of 19,406 to 17,342 at the end of 1954 while staffs of contractors employed on main Commission projects was 1,913 as at December 31, 1954, compared with 4,466 at the end of 1953.

**20. Q.**—How many frequency-sensitive items have been standardized since the program was inaugurated?

**A.**—By the end of 1954 a total of 2,626,631 items had been changed over. This represents the equipment of 421,470 customer services and of 66,528 customers who moved from 25 to 60-cycle areas of Southern Ontario. ■

ONE of Ontario Hydro's significant achievements of 1954 was the official opening of the Sir Adam Beck—Niagara Generating Station No. 2. This view, which shows the main floor of the new Niagara powerhouse, is reproduced from the Commission's publication, "Ontario Hydro — Nineteen Hundred and Fifty-Four."



# MUNICIPAL STANDARDS GAIN WEIGHT

## A.M.E.U. Committees Complete Five-Year Project With Presentation of Guide at Windsor Conference

**M**UNICIPAL delegations attending this year's A.M.E.U. Summer Technical Conference at Windsor went home three pounds heavier than they had been on arrival.

The reason: each delegation carried away a much-prized, 290-page volume entitled "Guide to Municipal Standard Construction," representing five years' hard work on the part of the A.M.E.U.'s Municipal Standards Committees. The new publication keynoted the entire conference. It promoted much enthusiastic comment as well as lively discussion, and was unanimously accepted by the delegates, who approved a resolution recommending it to the O.M.E.A., subject to such amendments or additions as may be found necessary from time to time.

"This is *your* guide; please use it," said Norman A. Grandfield, Galt, Chairman of the Standards Committees, as he formally presented the important handbook to the 300 delegates representing 103 municipalities who attended the three-day conference. Each municipality present received a bound, loose-leaf copy of the guide. It was

pointed out that every volume is numbered and registered in the name of the member municipality for handy reference. Provision is made for any necessary revisions, and each page or section bears a code number to facilitate future amendments. For instance, said Mr. Grandfield, the number "55" indicates "1955," and, if a revision is necessary two years from now, it will read "57" for "1957." The volume contains sections on overhead construction, as well as distribution design and stations, while a further section is to be added on underground construction.

President H. A. Howard, Thorold, in welcoming the delegates to the conference, recalled that the O.M.E.A. passed a resolution calling for municipal standards six years ago. This resolution was implemented by the formation of a joint committee of the O.M.E.A. and the A.M.E.U., later enlarged to include engineering representatives of Ontario Hydro. As the planning for this committee increased, three sub-committees were formed. Later the O.M.E.A. established a further committee for ad-

ministrative purposes. The guide has now become an accomplished fact, and the president expressed the hope that the delegates would welcome and appreciate the result of this co-operative project.

### Great Benefit

Paying tribute to those who had made the manual possible, M. J. McHenry, Ontario Hydro Consultant, Engineering Standards, referred to the pleasure it had given Hydro to be able to participate in the production of the guide. The volume, he said, represents a considerable outlay in time and money by all concerned, but will undoubtedly prove of great benefit.

The report of the sub-committee on Overhead Construction was presented by its Vice-Chairman, Ray Pfaff, St. Catharines, in the unavoidable absence of the Chairman, G. L. Lillie, Toronto. Members of this committee include John McDiarmid, Hamilton; Stanley Webster, Tillsonburg; E. W. Burbank, Toronto; W. D. Stalker, Simcoe; John Torrance, Etobicoke, and, from Ontario Hydro: T. J. Burgess, A. E. Green, R. E. Jones, and R. E. Treen.

The report of the sub-committee on Distribution Design and Stations was given by its Chairman, A. L. Furanna, London. Members of this committee, many of whom participated in a panel discussion, include H. A. Howard, Vice-Chairman, Thorold; Robert Butter, Owen Sound; A. G. Stacey, Guelph; W. R. Secord, Brantford; K. H. Anthony, Scarborough; H. J. Chambers and W. H. Smith, Toronto, and Aaron Gusen, G. M. McHenry, H. P. Cadario, and N. F. Seymour, Ontario Hydro.

So great was the interest evoked by the report of the sub-committee on Underground Construction, presented by its Chairman, J. G. Sutherland, Hamilton, that discussions extended over two sessions. Delegates were provided with mimeographed copies of the excellent presentation, and Mr. Sutherland



left no doubt that the field was wide open for suggestions, which would be of use to his committee in preparing a final draft. Program Chairman G. R. Davis, Kingston, had to call a reluctant halt to the discussion period, or the conference might have had to carry over for another day. Members of the sub-committee on Underground Construction include: J. A. Williamson, Vice-Chairman, Niagara Falls; A. W. Bromley, Kitchener; L. P. Forebare, Toronto; C. L. Leach, Chatham, and C. N. Fry, F. B. Grahame, and J. W. Simpson, Ontario Hydro.

### Financial Forecasting

Although delayed by a train wreck, E. H. Banks, Assistant General Manager and Comptroller, Ontario Hydro, left no doubt in the minds of the municipal representatives present that he was on the track when it came to pointing out the necessity for "Financial Forecasting in the Municipality."

The Canadian economy, and with

it, of course, that of Ontario, has been expanding at a phenomenal rate since the end of the war, Mr. Banks stated. The end of this expansion is still not in sight. Expansion in Ontario has made financial forecasting an absolute necessity. The forecast is needed to ensure that the growth of the utility will keep pace with the growth of the municipality. If there is growth, it is obvious that money must be raised in one way or another. The financial forecast, he said, gives a picture of whether or not changes in rates are likely to be necessary, and when and if financing will be required.

Fairness to the customer must be kept in mind at all times. Financing by means of an increase in rates

means that the present users of electricity are paying, in a short period, for facilities that may last 20 years. The reverse is true if a 20-year debt is incurred for facilities that may be obsolete or worn out in five years. With a financial forecast, such situations can, to a great extent, be eliminated, the speaker intimated.

No expenditure should be undertaken that will dangerously deplete a utility's working capital. Current assets, less current liabilities, should leave net liquid capital equivalent to about two months' out-of-pocket expenses—one month's cost of supplying service and one month in which to bill and collect.

There are only three methods of financing capital expenditures, said  
(Continued on page 26)

A.M.E.U. sub-committee on Distribution Design and Stations, left to right, Aaron Gusen, Ontario Hydro; Robert Butler, Owen Sound; H. P. Cadario, N. F. Seymour, G. M. McHenry, Ontario Hydro; Chairman A. L. Furanna, London; W. R. Secord, Brantford; A. G. Stacey, Guelph; W. H. Smith, Toronto, and H. A. Howard, Thorold, Vice-Chairman, discuss the new "Guide."



the speaker, and these are: (1) from internal resources, such as depreciation funds; (2) a bank loan; (3) long term debentures. Of course, there may be a combination of any of these methods, but each case should be decided on its merits, bearing in mind that no discrimination should be made against either present or future users of electricity.

In Mr. Banks' opinion, bank loans should be resorted to by a utility only in cases where it is estimated that the internal resources based on current rate structures, will, within two years, discharge the loan and any other contemplated expenditures in that period. In no case should a bank loan be considered as a means of financing, when it requires an increase in rates to discharge the loan. A bank loan, of course, may be necessary

while a debenture loan is being negotiated.

### Municipal Co-Ordination

"Most municipalities," he stated, "will have no difficulty in financing by means of debenture, but close attention should be given to co-ordinating the needs of the electrical utility of any municipality with other needs of the municipality. Obviously an intelligent financial forecast would mean that the forecaster has been in touch with other departments of the municipality. This is particularly necessary in the case of a municipality where subdivisions are growing or industries are moving in. Such co-ordination is important if the municipality is to have an overall view of its total debenture requirements."

Mr. Banks said there might be a tendency upon the part of the municipal corporation to overlook the financial needs of the electrical utility because of its self-supporting nature. However, it will be self-supporting only if rates are kept in step with cost. Undue rate increases may be avoided if municipal expansion can be confined to logical and economic areas. For this reason, the utility should follow closely the planning discussions of the corporation, and make appropriate representations when it appears that the interests of the utility might be adversely affected.

"I have already suggested to our Consumer Service Division and our regional municipal accountants that an endeavor should be made to make an annual forecast of each utility's requirements for two years ahead. Such a forecast would, of course, be worked out jointly with each utility at some specific time each year, and would be reviewed annually. We hope to develop such a procedure on an effective and co-operative basis."

Mr. Banks pointed out the interest of Ontario Hydro in rate structures and financing. The municipalities are aware that it is necessary

to get the assent of the Commission for capital expenditures, financing, and rates. In addition to other considerations, this provision has been placed in the Power Commission Act in order to protect the bondholders of Ontario Hydro. Ontario Hydro's debt, at present, is slightly over \$1,220,000,000, to be amortized over a 40-year period. In the long run, Ontario Hydro's stability depends upon the stability of the member municipalities. In giving assent to capital expenditures and related financing, the Commission bears in mind the rates in the community compared with other utilities of comparable size, location, and diversity of load. Ontario Hydro cannot and does not finance municipal Hydro expenditures.

The two-year forecast requires the co-ordination of a number of activities within the utility. The accounting function should supply information on past operations and maintenance costs, in order that intelligent forecasts may be made. It should also supply past statistics in respect to revenues. The data would provide a firm basis for preparation of the budget for operation and maintenance expenses. The engineering function should supply data in respect to contemplated capital expenditures, while the consumer service function estimates load, cost of power, and future revenues. The impact of the contemplated construction program on the rate structure must be given careful consideration at all times, and the effect should be gauged before any expansion is approved.

Reminding his listeners that depreciation, maturing debt, and frequency standardization expenditures are factors in a forecast, Mr. Banks added, "When frequency standardization is to take place within the municipality, during the two-year forecast period, it would be wise for you to estimate the costs which you will have to bear. If you require any assistance in making this estimate, you should contact the

PRESIDENT H. A. Howard, left, and Program Chairman G. R. Davis open the three-day Summer Technical Conference at Windsor.





regional office for information, in order that it may be considered in the financing plans."

Mr. Banks concluded with an interesting forecast on the current trend of money supply and interest rates, prepared by Hydro's Treasurer, F. R. Brebner, which many of the delegates found of great assistance.

Tracing the history of the Guide, W. Ross Strike brought the thanks of the Commission to the committees for a splendid job well done. "The whole Hydro organization," he said, "owes them a debt of gratitude." The Guide, said Vice-Chairman Strike, is not intended to mould the municipalities into a straitjacket. It is simply what it purports to be . . . a guide. Mr. Strike foresaw it as a very effective implement in promoting co-operation between individual municipalities as well as between local utilities and Ontario Hydro.

At the annual dinner, Gordon Fuller, Chairman of Windsor Utilities Commission, brought greetings to the delegates.

In bringing greetings from the O.M.E.A., the organization's President, Lt. - Col. A. A. Kennedy, newly-appointed Ontario Hydro Commissioner, stressed the great value of the Guide. He emphasized the importance of being prepared to constantly amend the Guide and keep it up-to-date.

Warren P. Bolton, Windsor Utilities Commission, brought a hearty welcome to the conference from the City of Windsor and its citizens on behalf of Mayor Michael Patrick.

President's Citations

An interesting feature of the dinner was the presentation to the  
*(Continued on page 29)*

THREE delegates, left to right, Frank Buckley, Guelph; Charles Daniels, New Hamburg, and Rudy Senyshen, Kitchener, discuss the blue of the conference during a recess.



△ SOME of the men who guided the "Guide" were, left to right, J. G. Sutherland, Hamilton; M. J. McHenry, Ontario Hydro; N. A. Grandfield, Galt; A. L. Furanna, London, and Ray Pfaff, St. Catharines. Copies of the new publication have been issued to all member utilities.



△ TOURING Henry Ford Museum at Dearborn, Mich., delegates test the springs of a 7-passenger White Steamer built in 1907. At the wheel is Gordon Fuller, Windsor, with R. A. Coleman, Port Hope, right. In the touring seat are A. D. Stewart, Wallaceburg, left, and Grant Stickney, Stratford. In the back seat, left to right, Syd Wilson, Toronto; I. L. Bradley, Waterloo, and Clarence King, Dresden. Tour was arranged by Windsor Utilities Commission.







**VICE-CHAIRMAN HONORED** - Superintendent of the Sunday School of Trinity United Church, Bowmanville, W. Ross Strike, Q.C., Hydro's Vice-Chairman, (back row second from left), retired from that position at the end of June this year. In appreciation of his 29 years of faithful service he was presented with a mantel clock recently. The gift came from the congregation through the Official Board, Women's Association, Jack and Jill Club and Sunday School. Miss Patsy Thompson, in the front row, right, made the presentation to Mr. Strike; little Maureen Morgan, centre, presented Mr. Strike with a boutonniere, and Bruce Barrett (left), presented Mrs. Strike with the bouquet which she is holding. Ross Richards, who stands beside Mrs. Strike in the photograph, (right), as Chairman of the Christian Education Committee of Session, read the address accompanying the presentation to Mr. Strike. Rev. T. A. Morgan, minister of Trinity stands beside Mr. Strike (left).

**NAME OFFICERS** - Two Ontario Hydro representatives, Joseph Beauchamp, Merivale, and T. H. Lewis, Western Region, London, were featured speakers at the spring meeting of the Eastern Ontario Metermen's Association. Held at Rideau Ferry, the delegates elected the executive, shown left to right: Joseph Beauchamp, Merivale; Kenneth Fee, Kingston P.U.C.; Robert Duval, Brockville P.U.C.; Clarence Labelle, Smiths Falls H.E.C., President; Paul Giguere, St. Lawrence Power Company, Cornwall, and J. H. Lyons, Almonte P.U.C., Secretary.





## MUNICIPAL STANDARDS GAIN WEIGHT

(Continued from page 27)

chairmen of the sub-committees of President's Citations in recognition of the enterprise and leadership they had shown in municipal engineering, and, in particular, for their display of these qualities in their work as chairmen. The presentation to Gerald Lillie, Toronto, was made by Ronald Harrison, Scarborough Township, and received by E. J. Woelfle on Mr. Lillie's behalf. Robert Butter, Owen Sound, presented the award to J. G. Sutherland, while J. E. Teckoe, Jr., Windsor, made the presentation to A. L. Furanna.

Practical demonstrations, as well as discussion panels were another highlight of the conference. After viewing Windsor's installations of mercury vapor street lighting, the delegates heard a fine paper by H. R. Soutar, of the Windsor Utilities Commission staff, on the installation of such lighting. Mr. Soutar said that only during the past decade has mercury lighting come of age as a street lighting medium. He prophesied that within another 10 years it will become the most common means for lighting heavier traffic arteries. He based his prediction on the remarkable efficiency of the mercury lamp in producing visible light. The standard, clear, 500-watt incandescent lamp produces less than 10,000 lumens; the popular mercury street lighting lamp—the EHI—has an initial light output of 20,000 lumens, with a total power input of only 460 watts.

Of interest and profit to the delegates was the tour, arranged by the Windsor Utilities Commission, of Greenfield Village and the Henry Ford Museum at Dearborn, Michigan, where complete replicas of early American life and times created much admiring comment.

—by Horace Brown.

## COURTESY SCORES A HIT

**M**EMBERS of a Toronto Hydro line crew came in for a well-merited "bouquet" from an appreciative customer after a recent line-moving operation at Algonquin Island in Toronto's harbor area. The customer was so pleased with the efficient workmanship of the crew that she sent the following letter to the *Toronto Globe and Mail*. The letter is reproduced in full herewith:

### The Courtesy of Hydro On The Island

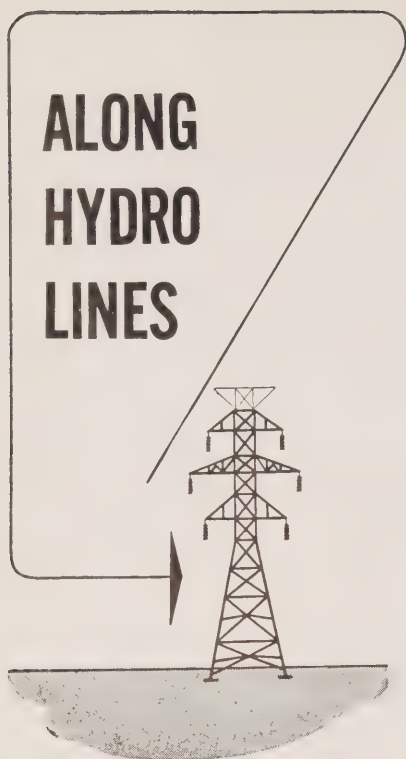
"The Hydro men presently working on Seneca Avenue at Algonquin Island, have a nasty job to do. The deplorable story of this avenue's fate through water erosion with all its destructive consequences, was in the news recently. The Hydro had to get busy and do something about their tottering and fallen poles, and their decision was to put in replacement poles about 15 or 20 feet back from the others—in other words, right on the residents' front gardens. Owing to the present damaged state of Seneca Avenue, the Hydro have no alternative, if power is to be supplied. So, on carefully tended lawns, their men have to gang up and gouge out a hole big enough to house a huge Hydro pole.

"Naturally, before this work started, residents feared the worst. Flowers, shrubs, hedges and lawns, all clipped, rolled, mowed, watered and fed, were practically "kissed" good-by by their owners. The evening terminating their first day's work, my husband took a walk up the street to their site of operations—partly to take inventory of his neighbor's wreckage, and partly to become better acquainted with "grief" and get hardened. He returned astonished and full of praise for these men. Though the holes required hand-digging and took plenty of men to get a pole into one, the job was neatly done and very precise; the hole was dug to scale, and the grass around not cut up with their boots.

"Next, I spoke to the men who arrived on our lot. Their general attitude and obvious reluctance to destroy what they had to, is worth writing about and certainly they deserve praise for a manner which would definitely do credit to a public relations department. One of the men said he felt badly about having to leave a small pile of sand on the grounds! I assured him we needed the earth and what was left would sink through our sandy soil in no time. He was quite sympathetic about the whole pole-digging project and seemed to take our disappointment in the ruined street personally. 'This surely is a beautiful little Island,' he remarked. 'We will try to be as careful as we can, and do the least possible damage to your grounds.'

"The Hydro should be proud of these 'ambassadors of good will.' In this case, their respect for our homes and gardens is doubly welcome as Seneca Avenue folks are feeling a bit battered these days. A bad situation is not so hard to take when one knows the other fellow is co-operating as much as he can."

Marie Dye  
Algonquin Island



#### **Retired Manager Marks 85th Birthday**

J. G. Archibald, Manager of the Woodstock Public Utilities Commission from 1901 to 1941, was the recipient of felicitations during the recent observance of his 85th birthday. A host of friends called on the retired P.U.C. Manager, who is still an active member of Chalmers United Church, Rotary Club, Y.M.C.A. Board and the Oxford Masonic Lodge. Mr. Archibald was made an honorary member of the A.M.E.U. in 1953.

#### **North Bay Launches \$200,000 Program**

North Bay Hydro Commission is implementing a \$200,000 program, to be completed this year, for improvements to substation No. 2; increase in capacity and additions to the building of substation No. 1, and additional street lighting. Approved by Ontario Hydro, the program will be financed from available funds and the issue of \$100,000 in debentures by the Corporation of the City of North Bay.

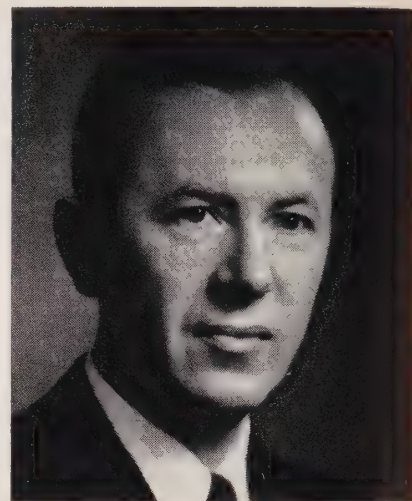
## **G. B. TEBO NAMED C.S.A. DIRECTOR**

G. B. Tebo, Director of the Commission's Research Division, was one of seven members elected to the Board of Directors of the Canadian Standards Association at its 28th annual meeting held in Ottawa. Others were: Alan Brown, Commercial Vice-President, Gatineau Power Co., Ottawa; J. H. Jenkins, Chief, Forest Products Laboratories of Canada, Department of Northern Affairs and National Resources, Ottawa; C. E. Macdonald, Manager, Canadian Sales and Development, International Nickel Co. of Canada Ltd., Toronto; A. A. Moline, Manager, Engineering Department, Power Products Division, Canadian Westinghouse Co. Ltd., Hamilton; P. L. Pratley, Consulting Engineer, Montreal; M. C. Thurling, Manager, Engineering Services Department, Canadian General Electric Company Ltd., Toronto.

Dean R. E. Jamieson, of McGill University, the retiring President, who has given 25 years' service to the work of standardization, declared that the vigorous growth in membership of the C.S.A. during its 36th year of activity, shows clearly the desire of Canadian industry to streamline its own far-flung organization.

#### **Membership Record**

General Manager F. A. Sweet stated sustaining memberships in the



**G. B. Tebo**

association has reached a record of well over 1,000 organizations — mainly industrial concerns, provincial government departments, municipalities and public utilities, and that 73 new and revised standards were published during the year.

The Board of Directors elected the following officers: President — J. S. Cameron, Vice-President — Manufacture, Northern Electric Co. Ltd.; First Vice-President — Dr. J. M. Thomson, President, Ferranti Electric Co. Ltd.; Second Vice-President — R. S. Eadie, General Manager, Dominion Bridge Co. Ltd.

#### **Build Fourth Unit At Manitou Falls**

To meet continuing load growth in the Northwestern Region, Ontario Hydro will add a fourth unit to its Manitou Falls Generating Station now under construction on the English River, with provision for a fifth unit as required. With the completion in late 1956 of the fourth unit, Manitou Falls G.S. will have a dependable peak capacity of

75,300 horsepower (56,200 kilowatts).

By proceeding with the installation of the fourth unit at this time and by making provision for the fifth when construction forces are working at the site, considerable economies will be realized. The new units will make available additional generating capacity to serve the future needs of Hydro's expanding Northwestern Region. Construction of the project is proceeding well ahead of schedule.



### **Ivan Shantz Dies At Kitchener**

Ivan A. Shantz, Vice-Chairman of Kitchener Public Utilities Commission died recently at Kitchener-Waterloo Hospital where he was under treatment for a heart ailment. Born in Peabody, Kansas, he came to Canada with his parents when less than a year old. As a young man he lived in western Canada for 10 years, returning to Kitchener in 1920.

Active in municipal and welfare work, he served for nine years on Kitchener City Council. He was, as well, a member of the Kitchener Public School Board, Board of Health and the Family Relief Board. At the time of his death he was an executive member of the local Chamber of Commerce, the K.-W. Family Service Bureau and Kitchener Red Cross. A former President of the local Y.M.C.A., he was a director at the time of his death and also Past President of K.-W. Federated Charities. A member of the Kitchener Public Utilities Commission for the past nine years, he was Chairman in 1951-1952.

He is survived by his son, Keith, of Kitchener, with whom he was associated in business; one sister and two granddaughters. Mrs. Shantz predeceased him six years ago.

### **New Store Equals Town's 1915 Demand**

Typical of the growth of electrical demands among individual customers within the past four decades, Simcoe Public Utilities Commission has announced that a new chain-operated food store in that town will have a connected load of 330 horsepower. Regarded as the town's largest commercial enterprise, the new store will use almost as much power as the entire town when Hydro service was inaugurated in 1915. At that time, the municipal substation had an installed capacity of some 400 horsepower to meet the demands of all Simcoe customers.

### **Hydro Opens Area Office at Bancroft**

Ontario Hydro has opened a new office at Bancroft to serve as the headquarters of the Bancroft Area. This area was formerly administered from the Lakefield office. Due to a steady increase in the number of customers and miles of rural distribution line in recent years, the Commission has found it desirable to open the new headquarters in the Bancroft municipal building.

### **Napanee Employees Boost Donations**

Employees of the Napanee P.U.C. have pledged a renewal of their payroll deduction contributions to the Napanee and District Memorial Community Centre campaign in the amount of \$975. This makes a total contribution of \$1,875 from local Hydro employees. The Napanee staff was one of the first groups to pledge 100 percent when the payroll deduction plan was started in June, 1954.



Stratford P.U.C. Vice-Chairman W. F. Nickel, left, presents watch to W. J. "Bill" Uniac.

## **Stratford Employee Honored**

About 135 employees, members, and guests of the Stratford Public Utility Commission ate turkey, laughed, sang, and heard others sing at their ninth annual dinner and social in the Stratford Y.M.C.A. auditorium recently.

The highlight of the evening was the presentation of a wrist watch by W. F. Nickel, Vice-Chairman of the Stratford Commission, to W. J. (Bill) Uniac — "not as reward, but as a token of our esteem" — on completion of 25 years' service with the P.U.C. Mr. Uniac is the 18th of the commission's 73 employees who have now served 25 years or more.

Three P.U.C. staff members: Miss Eva Hoffmeyer, James Scott, and Elton Stief, were presented with birthday cakes, while Mr. and Mrs. Carl Hewitt, recently married, were also the recipients of a surprise presentation.

Tribute was paid to the loyalty and achievements of P.U.C. employees by A. R. Moore, Commission Chairman; Mr. Nickel, and Commissioner A. David Simpson.

Door and draw prizes were won by Mrs. Keith Dale, Mrs. J. C. Richardson, Mrs. Ian Stubbs, of Hamilton, Orville Hill, and J. E. Wiggins.

## SCARBOROUGH'S GOLDEN ERA

(Continued from page 5)

early days of the local commission—the usual contrasts between “then” and “now.” In 1922, for example, when one Ontario Hydro substation served the entire township, the Scarborough Commission had a staff of 10. Compare that to the present situation: a building of 25,000 square feet of floor space and a staff of 189.



MEMBERS of the present-day Scarborough Public Utilities Commission, left to right: Chairman A. O. Leslie, Commissioner John Brown, Reeve O. E. Crockford and Ronald Harrison, Manager and Secretary-Treasurer.

The contrast between the old building and the new, and the increase in staff are representative of electrical expansion in Scarborough and symbolic, too, of the great growth of the township. And that the township is still in the muscle-flexing stage is seen in the fact that new industries are still locating in the district and residential building permits continue to increase. The past 10 years have truly been Scarborough's golden era and electricity has been the alchemist that made much of this possible. ■

### North Bay Grants Wage Increases

North Bay Hydro-Electric Commission recently announced a wage increase of 4½ percent for its 32 employees. In addition, the employees will have the cost-of-living bonus incorporated into the basic wage

**D**URING July of this year, power from Ontario Hydro's province-wide system was made available on Pelee Island for the first time. Although a few residents have had small gasoline-operated electric generators, electric power has not been otherwise available. After much planning and detailed engineering, Ontario Hydro completed laying of a power cable from the tip of Point Pelee to Scudder on the island's north shore to transmit Hydro power from the mainland.

This event is regarded as one of the great developments in Pelee Island's history. From the beginning, the island's progress has been somewhat hampered by its natural isolation from the mainland and by the large area which was below lake level and flooded for most of the year. Improved air and water transportation and radio-telephone communication have largely overcome the disadvantage of isolation from the mainland. Elimination of the marshes by construction of drainage canals and pumping schemes was carried out late in the last century. The one remaining impediment to development of the island has been the lack of an ample power supply in convenient form at reasonable cost. This condition will now be changed and electricity will help to provide for the further development of its resources.

The late Noah Garno, former

rate. The commission noted, in its announcement of the increase, that salaries and other conditions prevailing in comparable communities had been closely investigated, and it was found that the rates prevailing in North Bay were, in numerous cases, lower than in other cities of approximately equal size. ■

## POWER FOR PEELE

Reeve of Pelee Township, wrote a very fine historical and descriptive booklet entitled “The Story of Pelee.” In this booklet he visualized the importance of a low-cost power supply to the development of the area and suggested the possibility that some day Pelee's power requirements would be taken care of by Ontario Hydro.

Although the major construction problem in the project involved the laying of the cable from Point Pelee to the island, there was also some construction on the island itself as the distribution system involves some 26 miles of line. Upon completion of the installation during July, service was supplied to more than 200 rural customers, principally for farm, hamlet and commercial purposes. (As of June 1, 1955, Ontario Hydro had received signed applications from 214 customers on the island).

The insulation on the special cable is protected from the water by an outer casing of lead which, in turn, is protected from damage by an outer wrapping of steel wire armour. This cable, 1-1/3 inches in diameter, with a total weight of 90 tons, was laid in three lengths.

Residents of Pelee Island are receiving power supply on the same basis as Ontario Hydro rural customers on the mainland, thus opening the way for further development of Pelee's fishing and tourist trade.

### Name Commissioner

Clarke Wardlaw, a former councillor, has been appointed to the Etobicoke Hydro Township to complete the unexpired term of George T. Trowhill, who died recently.



## ERIC P. MUNTZ

**W**IDELY-known as a consulting engineer with Ontario Hydro's Engineering Branch and as Director of the former Consulting Engineering Division, Eric Muntz died recently. Mr. Muntz had been responsible for



Eric P. Muntz

the design and planning of Hydro's Engineering and Services Buildings in Toronto and of the A. W. Manby Service Centre at Islington, Ontario, as well as the installation of Bailey bridge structures at the site of several Hydro construction projects.

Born in Toronto in 1892, Mr. Muntz attended Upper Canada College, graduating in engineering from the University of Toronto in 1914. Shortly after the First World War broke out, Mr. Muntz served overseas as a Captain with the 1st Canadian Railway Battalion. He served in France, and in Palestine with General Allenby, and was twice mentioned in dispatches.

After the war, Mr. Muntz formed his own company, E. P. Muntz Limited, which built the high level and low level bridges in Hamilton,

and the Grand River Bridge at Paris. It also constructed the Bathurst St. bridge in Forest Hill (Toronto), and various other well-known bridges.

For seven years, E. P. Muntz was associated with the Foundation Company of Canada at Montreal, coming to Hydro in 1944 as Director of the Consulting Engineering Division. When this Division was disbanded, he was appointed consultant in the Engineering Branch.

Mr. Muntz was a life member of the Engineering Institute of Canada, of which he had been Ontario Vice-President. A Past President of the Association of Professional Engineers of Ontario, he was first Chairman of the Prestressed Concrete

Development Group, a member of the Corps of Professional Engineers of Quebec, and was licensed as a professional engineer in New York State. Mr. Muntz was awarded the Keefer Medal by the Engineering Institute of Canada in 1948. He was a member of several committees of the Canadian Standards Association, and held patents on a number of construction devices.

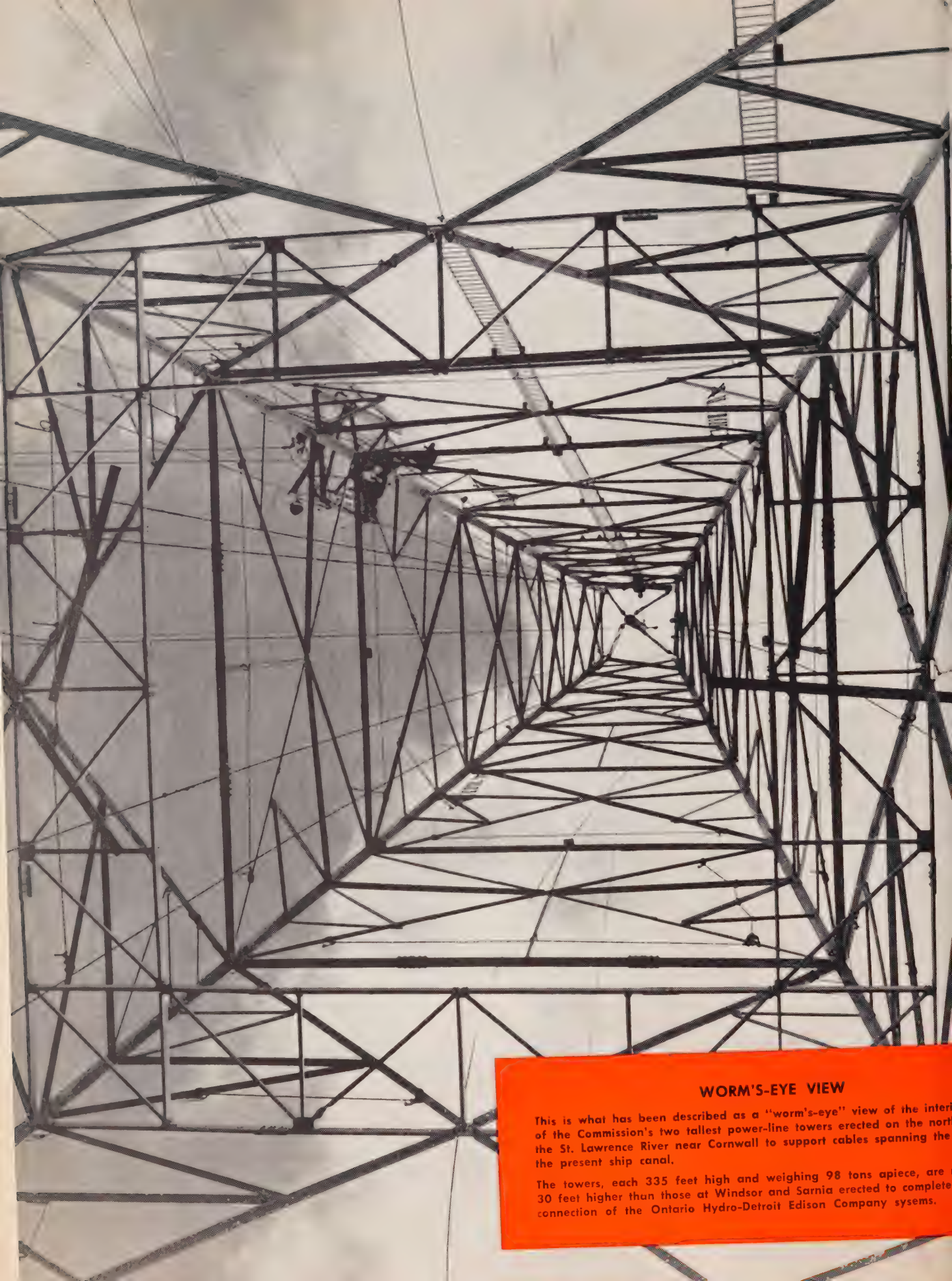
His wife, the former Marjorie Louise Weller, predeceased him in 1949. He is survived by two daughters, Madeline, Guelph, and Mrs. David O. Davis, Hamilton; one son, Eric, entering his fourth year of the aeronautical engineering course at the University of Toronto, and two sisters, Elizabeth Wood Muntz and Hope Muntz, both in England. ■



## PETERBOROUGH PRESENTATION

**C**OMPLETING 22 years' service with Peterborough Utilities Commission, Ernest L. Burnham was feted recently by the members and staff of the Peterborough Commission when he left for Belleville to become assistant manager of Belleville Utilities Commission. In the accompanying photograph, Peterborough Chairman Dick Raine (left foreground) is shown as he congratulated Mr. Burnham after presenting him with a set of golf clubs. Looking on left to right, are: W. Howard Powell, General Manager; James Turnbull; Business Manager and Secretary; H. G. Beatty, Electrical Superintendent; Commissioner Frederick Hills; Commissioner G. A. Macdonald; E. F. Reid, Waterworks Superintendent; Frank Worsencroft, Meter Superintendent; Duncan McKinnon, Gas Superintendent, and James Harrison, Filtration Plant Superintendent.





#### WORM'S-EYE VIEW

This is what has been described as a "worm's-eye" view of the interior of the Commission's two tallest power-line towers erected on the north shore of the St. Lawrence River near Cornwall to support cables spanning the present ship canal.

The towers, each 335 feet high and weighing 98 tons apiece, are 30 feet higher than those at Windsor and Sarnia erected to complete connection of the Ontario Hydro-Detroit Edison Company systems.



ONTARIO HYDRO

# News

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## MINIMUM TARGET

IN THIS issue (see Page 2) we direct further attention to the design and construction of Canada's first nuclear-electric station—known as "Nuclear Power Demonstration" or "NPD"—which is being undertaken jointly by Ontario Hydro, Atomic Energy of Canada Ltd., and the Canadian General Electric Co. Ltd. on Commission-owned property near its Ottawa River Des Joachims Generating Station.

As this article indicates, the probable form of the station was described in a booklet as well as in diagrams, which were included in a large Atomic Energy of Canada Ltd. display at the recent International Conference on the Peaceful Uses of Atomic Energy held at Geneva, Switzerland. (Ontario Hydro and the associated municipalities were represented at this important scientific gathering by Chairman Dr. Richard L. Hearn, a Director of Atomic Energy of Canada Ltd., and Harold A. Smith, Hydro's Director, Nuclear Power Project.) The article referred to above contains the significant announcement that a group (which will include Commission representatives) will carry out a preliminary design study for a 100,000-kilowatt nuclear-electric station "while the design and construction of 'NPD' goes forward."

This statement is of particular interest to those associated with the Canadian power field, especially in view of certain forecasts of the role of nuclear-electric power in Canada presented by Dr. John Davis, Economics Branch, Canadian Department of Trade and Commerce and Dr. W. B. Lewis, Vice-President, Research and Development, Atomic Energy of Canada Ltd., during the Geneva Conference. While cautioning that nuclear-electric plants are unlikely to displace Canada's present sources of energy, Dr. Davis said that "as many as 10 medium to large (100,000-kilowatt) nuclear power plants may be required in Canada in the late 1960's or early 1970's." Stressing the importance of the Commission's participation in the feasibility studies and the current design and construction of the first nuclear-electric plant at Des Joachims, was Dr. Davis' prediction that "the majority of these (nuclear power plants) may be located in southern Ontario," as the rising demand for electricity will have "largely outstripped the available hydro-electric resources of the province by the early 1960's."

Dr. Davis warned, however, that the larger nuclear-electric plants would have to achieve a "minimum target" of approximately six mills (\$.006) per kilowatthour (equivalent to the cost of producing electrical energy close to the region's principal load centres from coal delivered to Toronto or Windsor at prices as low as eight dollars a short ton—2,000 lbs.) "if they are to be truly competitive sources of power in southern Ontario—their most likely area of application in Canada."

While, as the article on Page 2 frankly indicates, power produced by the pilot or "NPD" plant at Des Joachims will not be competitive in cost with the output of hydro-electric or conventional thermal stations, it will provide invaluable information for the preliminary design studies relating to the larger plant, as well as data on the economics of nuclear power production — one of the main, ultimate objectives being the achievement of a minimum target similar to that specified by Dr. Davis.



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### COVER PHOTOS

PRESENTING an interesting pictorial conception of a portion of the St. Lawrence-Cornwall Canal area, the photograph on our front cover this month also depicts one of the most ingenious Bailey Bridge structures ever designed and built by Hydro engineers. Spanning the canal at Lock 19 near Cornwall, the unique bridge was constructed to facilitate movement of heavy construction equipment and machinery to the site of the Ontario section of the St. Lawrence powerhouse. A retractable section of the bridge (shown in a closed position just after an upbound vessel had passed through; another is waiting to enter the lock), slides back on a supporting structure (extreme lower left) to permit uninterrupted water traffic.

Reminding us that autumn arrived officially on the 21st day of September, is the peaceful harvest scene on our back cover, which was recorded by a Hydro photographer near Kingston, Ontario.





**P.A.** (Bud) Lawson, Hydro's Harrow Area Manager, inspects the fluorescent lighting arrangement in one of the greenhouses at the Federal Department of Agriculture's Science Service Laboratory, Harrow, Ontario, where crop test plants are grown throughout the entire year with the aid of this novel lighting installation (see "Farmers' Friends," page 18).

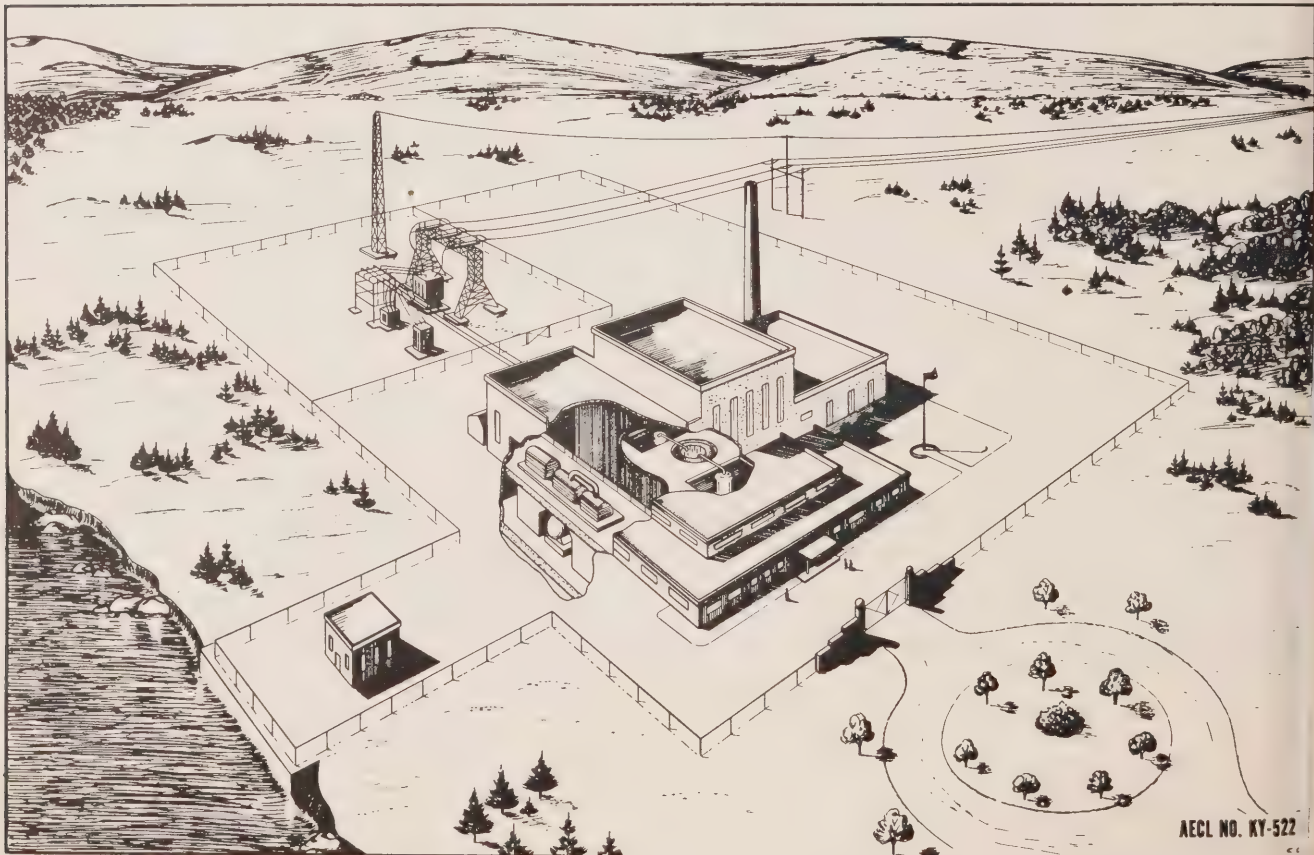
# POWER PLAN

Preliminary description of Canada's first nuclear-  
electric station released at international conference

A preliminary description of Canada's first nuclear - electric power station — known as the "Nuclear Power Demonstration" — was presented at the Canadian exhibit at the recent international conference on atomic energy in Geneva, Switzerland.

Detailed design of the power station is just getting underway, but its probable form was described in a booklet prepared by Atomic Energy of Canada Limited for the International Conference on the Peaceful Uses of Atomic Energy at Geneva, August 8 to 20.

Dr. Richard L. Hearn, Chairman of Ontario Hydro and a Director of Atomic Energy of Canada Limited, attended the international conference, being accompanied by Harold A. Smith, Ontario Hydro's Director, Nuclear Power Project. The Hydro representatives were





part of a 26-man Canadian delegation, which was headed by W. J. Bennett, President of Atomic Energy of Canada Limited. The main topics on the agenda were atomic power and the use of radioactive isotopes in medicine, biology, agriculture and industry.

The station is to be built by a combined force of engineers and scientists employed by government and private industry (see *Ontario Hydro News*, June, 1955) and will be located on land owned by Ontario Hydro near its Des Joachims Generating Station on the Ottawa River, about 150 miles northwest of Ottawa. It will be an experimental station generating approximately 20,000 kilowatts, and the cost of the power produced is not expected to be competitive with that produced by hydro-electric or conventional thermal stations. It is scheduled to go into operation in 1958.

The main objectives of such a station of low power rating are:

1. To demonstrate that electricity can be generated by a nuclear plant of such a design and to provide information for the construction of a large-scale station;
2. To gain practical data on the economics of power production with nuclear plants;
3. To gain experience in design and operation, particularly on those aspects which differ from research reactors;
4. To train personnel, both in plant design and in operation.

### 100,000-Kilowatt Station

While the design and construction of "NPD" goes forward, a preliminary design study for a 100,000-kilowatt (electric) station will be carried out by a group composed of engineers and scientists from various power organizations throughout

Canada and from the staff of Atomic Energy of Canada Ltd. The detailed design and construction of such a station, and of future atomic power stations in Canada, would be the joint responsibility of private industry and of the various power companies.

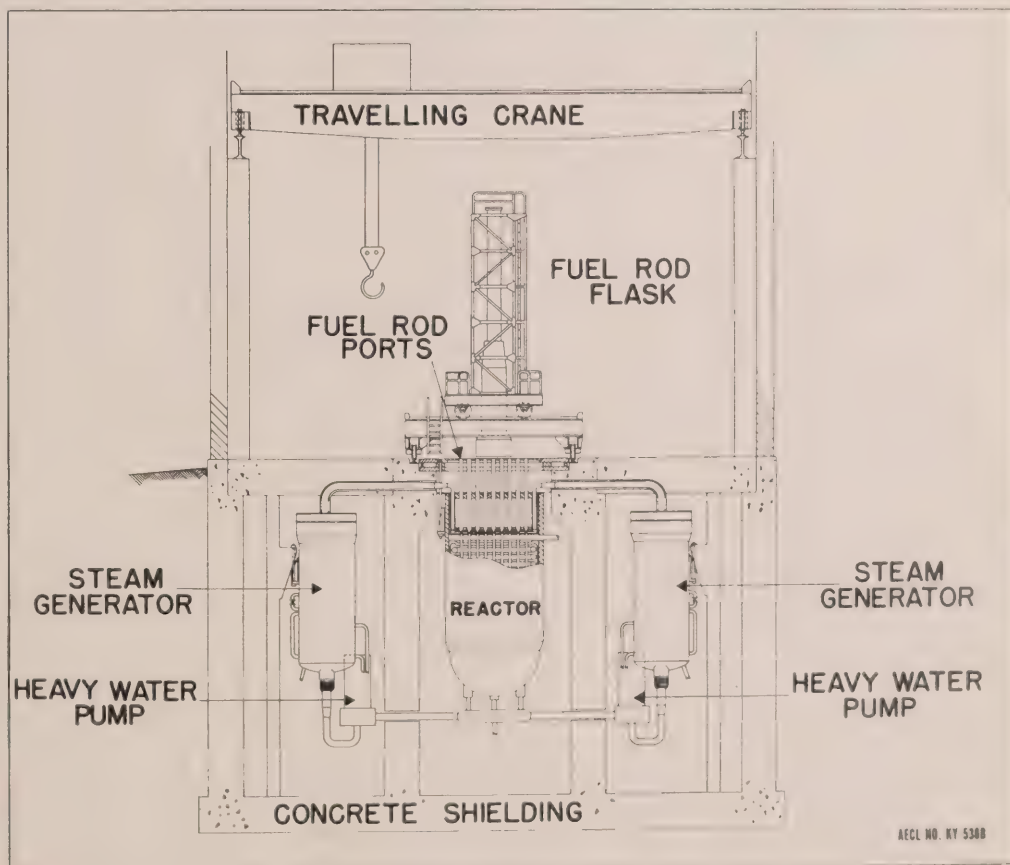
The estimated cost of a 20,000-kilowatt plant of the design envisaged for "NPD" is just over \$11 million. Atomic Energy of Canada Limited will be responsible for the reactor portion of the plant with the Canadian General Electric Company Limited contributing to the cost of its design and engineering. The conventional section of the plant (turbine, electric generator and transmission gear) together with the land and the buildings will be the responsibility of Ontario Hydro.

Ontario Hydro will also operate

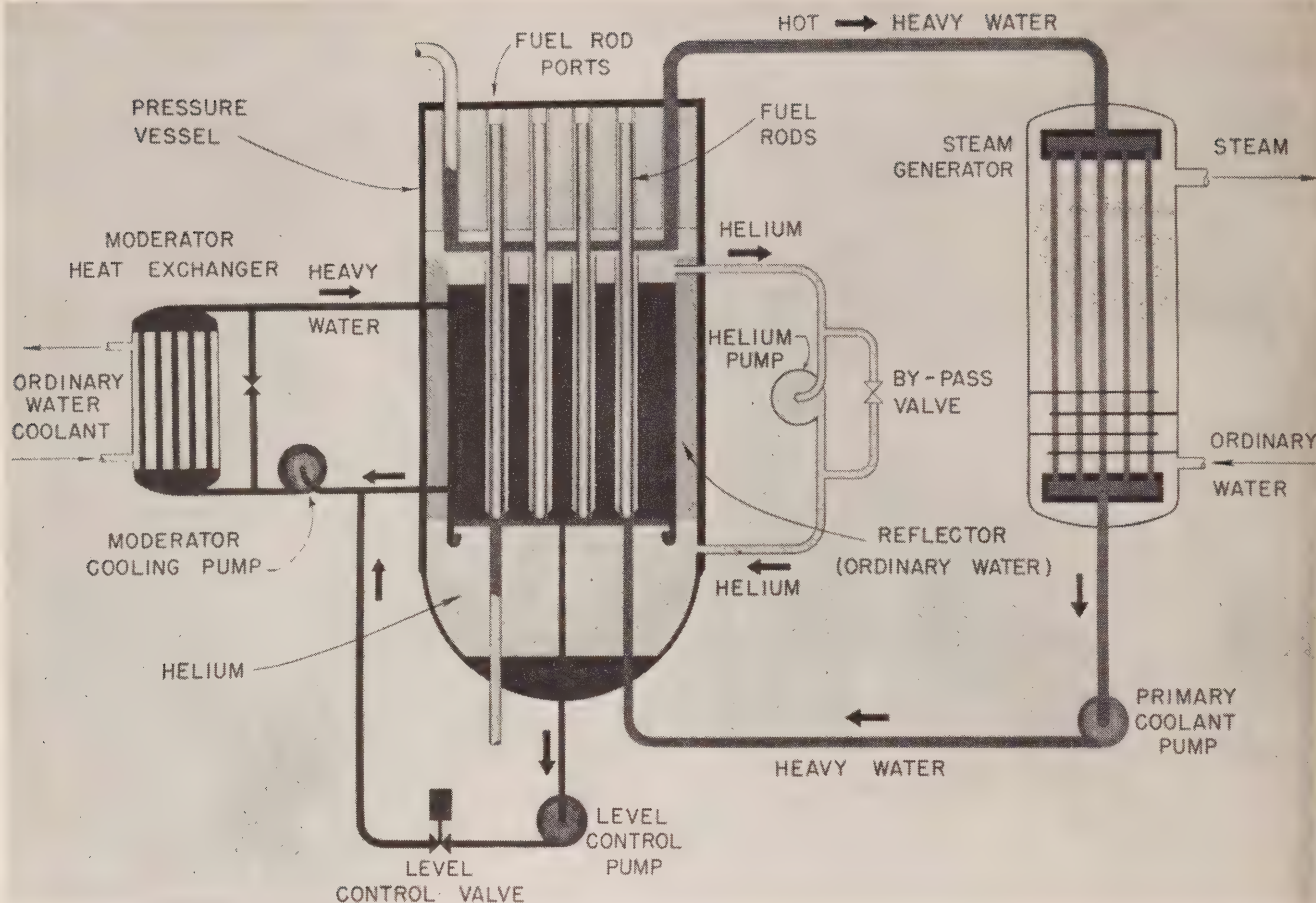
(Continued on Page 4)

it's conception of Canada's first electric station, which is to be Ontario Hydro's Des Joachims Station on the Ottawa River.

EMATIC drawing of "NPD" (Nuclear Demonstration), which is scheduled for operation in 1958. The station will use natural uranium fuel (possibly slightly enriched with <sup>235</sup>U) in the form of about 200 rods sheathed in zirconium—and also heavy water as a moderator and coolant.



AECL NO. NY 5300



SIMPLIFIED schematic drawing showing the principle of operation of "NPD." Heavy water, heated by the fissioning of uranium in the reactor core, circulates through heat exchangers (steam generators) where ordinary water is converted to steam, driving a turbine connected to a generator.

the plant and feed the electricity produced into its Ontario power network. The Atomic Energy of Canada Limited will reimburse the Commission for the cost of operating the reactor portion of the plant. Ontario Hydro will purchase the steam generated from the reactor from A.E.C.L. at an agreed rate.

The reactor will use natural uranium for fuel, possibly slightly enriched with plutonium, and heavy water for the moderator of neutrons (fast neutrons are given off when uranium-235 atoms split and they must be slowed down or "moderated" by some medium that does not capture neutrons readily, before they will split other uranium-235 atoms and thus maintain a chain reaction). The fuel will be

in the form of about 200 rods sheathed in zirconium. The fuel rods of the ZEEP, NRX and NRU reactors are sheathed in aluminum, but this metal would not withstand the corrosiveness of heavy water at the higher temperatures which will prevail in "NPD." The uranium must be sheathed not only to prevent its corrosion by the heavy water, but also to retain the highly radioactive fission products, which are formed when uranium atoms split or fission.

#### Two Systems

There will be two heavy water systems. One volume of heavy water will act as the moderator of the neutrons — this will not be in contact with the fuel rods. It will be circulated through heat exchangers

to keep its temperature between 60 degrees F. (15 degrees C.), and 260 degrees F. (127 degrees C.). The other heavy water system will be the "coolant" — that is, it will carry the heat given off by the fissioning uranium to the steam generators. In this case, the heavy water will flow through tubes surrounding the fuel rods and when it leaves the reactor en route to the steam generators it will be at a temperature of about 500 degrees F. (about 260 degrees C.).

This hot heavy water will flow through two steam generators where it will give up its heat to ordinary



water, which will be converted into steam. The steam will drive a turbine, as in a conventional thermal power station, and the turbine will drive electrical generators.

To prevent the coolant from boiling, the reactor will be placed within a steel pressure vessel where the pressure will be 1200 pounds per square inch or higher.

### Reactor Core

The core of the reactor — the equivalent of the "calandria" in the NRX reactor — will be about 10 feet in diameter and about 10 feet high. Around the outside of the core, aluminum tubes containing ordinary water may be wrapped to form the "reflector" (which reflects escaping neutrons back into the core). The reflector design has not been settled and, therefore, this arrangement is tentative.

The rate at which the uranium "burns" within the reactor depends upon the amount of moderator present and also upon the amount of neutron-swallowing material within the core. The NRX reactor is controlled mainly by moving a cadmium control rod (cadmium is a strong absorber of neutrons) in and out of the core. In the case of "NPD," however, it is possible that control will be achieved by changing the quantity of heavy water moderator in the core. Thus there may not be a control rod — one advantage of this arrangement would be that there would not be mechanical equipment inside a pressure vessel. The method of controlling "NPD" is not definitely settled and control rods may be used.

Experimental reactors, such as NRX and NRU, rise above their main floors. This allows experimental apparatus to be placed against neutron beam holes which run through the concrete shielding to the reactor core. In the case of "NPD," however, it will be necessary to have access only to the top of the core — to permit the changing of fuel rods. The reactor can there-

(Continued on Page 11)

# THE GENERAL PRINCIPLES OF NUCLEAR POWER

*(Portion of text of a White Paper entitled "A Programme of Nuclear Power" presented to the British House of Commons by the Lord President of the Council and the Minister of Fuel and Power by Command of Her Majesty, February, 1955.)*

### The Nature of Nuclear Reactions

1. Mankind relies at present on two main sources of energy:—  
(a) Chemical reactions (where energy is released mainly in the form of heat derived from the burning in air of such organic substances as wood, coal, and oil), and  
(b) naturally occurring movements of large masses of matter (winds, and water falling under gravity.) The source of energy with which we are now concerned is fundamentally different from these forms of energy, although they are all ultimately derived from solar energy, which is itself a product of nuclear reactions taking place in the sun.

2. The atoms of which matter is composed, of which there are about 100 different kinds, are constructed on the same pattern: they consist of a dense central nucleus which carries a positive charge and is surrounded by a field of negatively charged electrons. The nucleus itself is made up of positively charged protons and uncharged neutrons. The number of protons, which equals the number of electrons, determines the chemical properties of the atom; while the total number of the particles in the nucleus (protons and neutrons) determines its mass. A change in the number of neutrons affects the mass of the atom but leaves its charge (and therefore its chemical nature) unaltered. Chemically identical atoms, that is, atoms having the same charge but different masses, are called isotopes. Uranium 235 and uranium 238 are different isotopes of the same chemical element, uranium, the number after the name of the element indicating the mass of the atom, i.e., the total number of protons and neutrons in the nucleus. Isotopes may be stable or they may be radioactive, i.e., tending to change spontaneously into other atoms or isotopes, while, at the same time, emitting particles or radiation. A change in the number of protons, on the other hand, affects the charge of the nucleus and, therefore, the chemical nature of the atom. The new chemical element produced by such a change may also be stable or radioactive. The radioactivity of different elements plays an important part in nuclear energy.

3. The commonest type of interaction between atoms affects only the electrons; the nucleus remains untouched. Reactions of this kind, of which the burning of coal is one example, are called chemical

(Continued on Page 11)

# POWER COMES TO PELEE

Inaugurate Hydro service for Canada's "southern isle"



**T**HE year is 1788 . . . a year that will go down in history because, among other things, it was the year in which Pelee Island was leased to one Thomas McKee for three bushels of corn. Move now to 1834, the year in which William McCormick, the first white man to settle there, bought the island for \$500. And now for another significant date in the history of Pelee Island: July 20, 1955. That's the day Ontario Hydro came to Pelee and is, without doubt, the most significant of the three dates; for, though the corn may have been green, and the \$500 even greener — and probably worth \$500—the coming of Hydro marked the beginning of a new era in the social and economic development of the historic island.

The closing of the switch that sent the power surging from the mainland through the underwater cable to the island also marked the realization of a dream — the dream of the late Noah Garno, a former Reeve of Pelee Island and its unofficial historian. Mr. Garno had been an energetic leader in the effort to secure Hydro for the island, and it was fitting that the late reeve's wife, Mrs. Ethel Garno, participated with R. M. Laurie, Ontario Hydro Manager, Western Region, in the switch-closing ceremony. The celebration, staged in a picturesque setting where the waters of Lake Erie wash the island's shore at Scudder, was attended by representatives of the Ontario Government, civic officials, municipal and Ontario

Hydro representatives, members of the press and radio and a large crowd of island residents.

Following testimonial addresses in memory of the late Ontario Hydro Chairman, Robert H. Saunders and the late Mr. Garno by William Murdoch, M.P.P., Essex South, and Pelee Island Township Reeve Charles Oare, and the observance of one minute of silence, Mr. Laurie was introduced to the gathering by Mr. Murdoch.

Referring to the international flavor of the gathering that saw Canadians mingling with American visitors, Mr. Laurie said that the coming of Hydro was a milestone in the history of the island, and he paid tribute to the residents for their co-operation with Hydro personnel. Mr. Laurie traced the course of events that led to the decision to go ahead with the project (the signing of 175 customers in 10 days was the deciding factor) and he outlined the difficulties in bringing power to the island and setting up a distribution system. Hydro workers had not only unusual engineering and construction problems to contend with, but also had to foresee the possibilities of natural hazards, since the island is isolated for part of the year. Added to this was the fact that 500 tons of equipment and supplies had to be transported to the island to set up the system.

Mr. Laurie congratulated engineers and construction men, who had

taken part in the Pelee Island project on a "ticklish job well done," and he said that island premises, all of which were wired under the guidance of Hydro experts, had the best wiring facilities available in the province. The Township of Pelee Island is now part of the Hydro family, said Mr. Laurie, and the people of the island could now feel that they were playing a personal part in the great Hydro enterprise, which meant so much to all the people of Ontario.

## Ontario's "Happiest Man"

Other speakers included Mr. Murdoch, who termed himself the "happiest man in Ontario" and Reeve Charles Oare, who described the event as a great moment in the history of the island. "With the coming of Hydro," said Mr. Oare, "gasoline-operated generators and kerosene lamps go out, and residents of Pelee, like their fellow citizens on the mainland, will be able to use all available electrical conveniences."

Prior to the advent of Hydro, island residents had to rely on small gasoline-operated generators for electricity. With the large number of electrical appliances on the market, it was often difficult to have more than a couple of them running at the same time. Neither fans nor electric irons could be used without starting an engine, and the use of refrigerators and electric stoves was out of the question. The coming of Hydro has changed all this, just as it has eliminated the



△ A MAJOR step in bringing power to Pelee Island was the laying of an underwater cable from the mainland. Here two tugs are propelling the barge which carried the cable.



△

TWO workmen with a hot job guide the armored conductor as it unwinds from the well of the barge during the exacting operation.



△

MEANWHILE Ontario Hydro crews were erecting poles and stringing conductor for the new distribution system.

necessity for householders to check every night to see that the gas and oil in the engines were sufficient for the day ahead.

One of the more common sights on Pelee Island after the electricity was turned on was that of residents getting rid of the low-voltage light bulbs, which had received their energy from gasoline-operated generators. One person seen ridding himself of these relics of the past was Harold V. D. Beard, Pelee's Clerk-Treasurer, who acted as master of ceremonies at the official event on the previous day, and who, on the same day, had acted in a similar capacity at a largely-attended luncheon in the township hall. As Mr. Beard thankfully deposited a basket of the low-voltage bulbs in a convenient ash can, he was heard to say that he had "waited for this day for a long time."

Hydro Day was also a civic holiday on Pelee Island. Dignitaries, well-wishers and the Leamington High School Pipe Band arrived on the island by boat and 'plane to take part in the celebration, and the proud islanders lost no opportuni-

(Continued on Page 21)



△

SMILES and cheers welcome Hydro as Mrs. Ethel Garno, wife of a former reeve, right foreground, and R. M. Laurie, Manager, Western Region, Ontario Hydro, close the switch to bring power to the island officially.

A CROSS-SECTION of the large crowd, which witnessed the "switching-on" ceremonies on July 20. Islanders of all ages flocked to Scudder, on the north shore of Pelee Island, to mark the inauguration of Hydro service.

▽





# BRUSH WARFARE

by FRED CORIN\*

**Chemistry comes to the aid of Hydro's forestry crews in keeping transmission line routes clear of "woody" growth**

GENERATING power by means of water or fuel is an important function, but delivering electricity to the ultimate customer is equally vital.

While much has been written and said about the generation of electricity, perhaps not so much is generally known about Hydro's "life lines" and the tremendous job involved in maintaining these transmission and distribution lines.

In supplying power to its customers, Ontario Hydro has direct contact with the problem of a comparatively small population spread over a vast area. The province has an area of 412,582 square miles and a population of about 5,046,000 persons—in other words a square mile of land for every 12 persons. By way of comparison, France has a population nearly nine times as great (some 42,500,000) living in an area just over half as large (212,659 square miles)—a square mile of land for every 200 persons.

In the huge network of power lines serving Ontario Hydro customers, 15,800 circuit miles of transmission line (sufficient to reach nearly four and a half times the distance from Halifax to Vancouver) carry the power to the big transformer stations located in various parts of the province.

Travelling through the country-



PROVING that the horse is not obsolete yet, this faithful "Dobbin" pulls the main section of hose up a steep incline as the operators spray a section of foliage-bearing undergrowth.

side, one sees the familiar giant, steel towers bearing on their great shoulders the high-voltage transmission lines. For example, these high tension lines transmit power from the Des Joachims development on the Ottawa River to transformer stations near Toronto, Burlington and London—some 350 miles distant from Des Joachims. Other lines carry power from the Commission's Abitibi Canyon power plant, which is within 125 miles of James Bay,

to mines, pulp mills and cities that are more than 200 miles away. These steel towers and the accompanying transmission lines stand as monuments to engineering achievement in the story of power transmission during the last half century.

## "Knotty" Problem

Engineering has developed bulldozers, half-tracks, four-wheel drive trucks, hoists and a hundred and one pieces of equipment, which have made building and maintenance of these high voltage lines possible. Helicopters have largely replaced

\*Mr. Corin is Ontario Hydro's Forest Management Officer





HYDRO'S brush control operations are strictly mobile. The truck on the left is refilling the 250-gallon tanks of a spray truck while work progresses in the vicinity of Cloyne, Ont.

the old foot-slogging and dog-team patrols for locating trouble along the lines. Finally, the chemist has come to the aid of Hydro's operations staff in solving one of the "knotty" problems connected with line maintenance—the control of plant growth on right-of-way areas.

The control of woody growth, which springs up on a right-of-way after the land has been initially cleared for line construction, is one of the most complex phases of maintenance. It is safe to say that there are in excess of 75,000 acres of such growth, which must be held in check. It must not be permitted to grow tall enough to reach the conductors. It must be possible, at any time, to move equipment on to a right-of-way in order to effect repairs in any emergency. Nothing can be permitted to stand in the way of maintaining that continuous supply of electrical energy, which Hydro must provide for its customers. But, it's no small task.

#### Manual Cutting

Prior to 1949, the brush was controlled by manual cutting. This method did not eliminate the woody growth, but temporarily kept it in

check. It was the only practical method to use and the job had to be done. A year or two after the brush was cut, it would be sprouting up again from three to five feet high and the cutting had to be repeated. Cutting did not eliminate the brush and, in many cases, encouraged it to sprout more abundantly. Today, thanks to exhaustive studies conducted by Hydro's chemical research engineers, it is possible to effect a better control over this plant growth with chemical sprays.

These chemicals, known as growth regulator herbicides, are 2,4-D (2,4-Dichloro-phenoxy-acetic-acid) and 2,4,5-T (2,4,5 - Trichloro-phenoxy-acetic-acid), which, when mixed together and diluted with water, are as deadly to plants as DDT is to insects; yet they are not toxic to animals nor to man. Small wonder then, that Hydro, ever on the alert for advanced ideas, has adopted such a method—a veritable chemical warfare on the jungle of plant growth, which insists on clothing the transmission line routes.

Ontario Hydro's brush-spraying

*(Continued on Page 10)*



SOURCE of supply for the spray trucks, a new, Hydro "swamp-buggy" backs into a beaver-pond. As water is pumped into the tanks through the hose, left, Driver George Marriott pours in the chemical concentrate.





WAIST-DEEP in dense undergrowth, Operator Alec Countryman takes unerring aim with the metal spray-gun, applying the chemical bath at a pressure of about 350 lbs. a square inch.

operations throughout Ontario commenced in a general way in 1950, although several sample plots were sprayed in 1948 and 1949 to determine the effectiveness of this method. This work is now handled by special crews under the guidance of Hydro's forestry superintendents in the nine regional offices across Ontario. Treatment of foliage-bearing growth starts late in May and continues until the growing period ends in early September. Foliage spraying later than September and during particularly cold or rainy periods is considered uneconomical as good "kills" are not common under such conditions.

Dormant spraying, or spraying under leafless conditions, using oil instead of water with a stronger concentration of chemical solution, is carried out during the months of January, February and March. This system is especially advantageous in reaching low, wet areas, which are frequently inaccessible except during the "freeze-up." In addition, dormant spraying gives the highest percentage of "kill" among

the more resistant species of brush, particularly hard maple growth.

Spraying has become a streamlined process in the past few years as new techniques have been evolved and put into general use. Three-ton trucks, mounting 250-gallon tanks, connected to reciprocating spray pumps, operated by gasoline engines, and as much as 1,000 feet of reel-mounted hose in many instances, are vital pieces of equipment. But old "Dobbin," the faithful work horse, has an indispensable role, too, in pulling the long hose over the rugged terrain, which spraying crews often encounter.

Two smaller sections of hose, fitted with long metal spray-guns, branch off from either side of the main hose, allowing two operators to cover a wide area of brush. Provided suitable weather conditions prevail and with reasonably normal ground conditions, one sprayer out-

fit can completely blanket an area of approximately 10 acres in an ordinary working day. Spray mixtures consist of 14 pints (76.8-ounce acid equivalent) of chemical concentrate to 250 gallons of water, applied at pressures up to 350 lbs. a square inch.

### Spraying Techniques

Improvement in spraying techniques in the past few years has enabled regional forestry crews to speed up this operation. Since 1950, the acreage covered has increased rapidly. In that year only 724 acres were given the chemical bath. Last year, the Commission sprayed nearly 15,000 acres of brush and used 1,720,000 gallons of spray mixture on the job. The target for 1955 is in excess of 15,000 acres, which will require over 2,000,000 gallons of the chemical liquid.

It is confidently expected that the brush will be completely elim-

*(Continued on Page 29)*



## POWER PLAN

(Continued from Page 5)

fore be sunk into a basement, with its heat exchangers beside it, and the top of the reactor will be on the same level as the turbine operating floor and the main control room.

Complete information on the design and performance of the demonstration power station and on the preliminary design study for the larger station will be made available to the Advisory Committee on Atomic Power, on which are represented the various privately and publicly-owned power organizations throughout Canada. This committee has held two sessions at Chalk River where it studied the existing Canadian reactors and the preliminary plans for "NPD." ■

## THE GENERAL PRINCIPLES OF NUCLEAR POWER

(Continued from Page 5)

reactions and the energy they release or absorb is relatively moderate. The energy and heat processes involved in a modification of the nucleus of an atom are about a million times greater. The purpose of nuclear fission or hydrogen fusion is to achieve the release of energy on this scale. A controlled hydrogen fusion reaction is not, at present, in sight, but the control of nuclear fission is well established.

4. Nuclear fission takes place when a free neutron, the uncharged constituent of the nucleus, is made to strike the nucleus of a fissile element, e.g., uranium 235. The three main results are as follows:—

(a) The nucleus splits into two "halves," which fly apart releasing energy which appears as heat.

(b) Several new neutrons are released by the affected nucleus. These can serve a variety of purposes:—

(i) Some of them may collide with other fissile nuclei, repeat the process of fission, and so establish a

## HON. WILLIAM K. WARRENDER, Q.C. NAMED HYDRO VICE-CHAIRMAN

Appointment of the Hon. William K. Warrender, Q.C., M.L.A., as Minister without Portfolio in the Executive Council of Ontario and Vice-Chairman of Ontario Hydro was announced by Ontario Prime Minister Leslie M. Frost on August 17.

Well-known in the public life of Hamilton, Ontario, the Commission's new Vice-Chairman was born at nearby Stoney Creek on August 5, 1908.

Educated at Ryerson Public School, Hamilton Central Collegiate and McMaster University (B.A.) in Hamilton, Mr. Warrender graduated from the University of Toronto (LL.B.) and Osgoode Hall Law School. Active in the municipal life of his native city for several years, he was a member of the Hamilton Board of Control, being senior Controller and Vice-Mayor. During World War II he served with the R.C.A.F.

First elected to the Ontario Legislature in 1951 to represent the



HON. W. K. WARRENDER, Q.C.

constituency of Hamilton Centre, he was named Minister of Planning and Development on January 20, 1953, holding this post until his latest appointment.

An ardent golfer, Mr. Warrender is a member of the Burlington Golf and Country Club and the Hamilton Thistle Club. Mr. and Mrs. Warrender have two sons, William and Richard.

chain reaction, which can be controlled to provide a continuing release of energy.

(ii) Others may be captured by the nuclei of neighbouring non-fissile atoms, such as uranium 238. This then becomes uranium 239 which is radioactive and changes rapidly to plutonium 239. Plutonium 239, by contrast with uranium 238, is fissile, that is, it will itself undergo fission when struck by a neutron.

(iii) Finally, some neutrons may be a total loss, in the sense that they may be absorbed or lost in ways which make no contribution either to the chain reaction or to the production of fresh fissile material.

(c) The two "halves" into which the original nucleus splits are called fission products. In general, they are radioactive and because they are potentially harmful to life and may be destructive of materials, it is necessary to keep control of them for a long time; but fortunately their bulk can be made quite small.

5. The heat from the fission of the nuclei can be used to produce steam to drive an electric generating plant. The reactor, i.e. the plant in which fission takes place, is thus the equivalent of the coal or oil-burning furnace of existing power stations. ■



E. L. GIBSON, left, social studies teacher at Alexander Muir Public School, who supervised production of the display, explains the features of the St. Lawrence model to Principal J. B. Davies, centre, and D. M. Davis, Toronto Board of Education social studies consultant.

# MODEL STUDENTS

by J. G. MURPHY

**D**EVELOPMENT of electric power may, at first glance, appear to be a subject considerably removed from the field of social studies, but a second and longer glance at the subject with all its many ramifications and its importance to modern living would suggest that it is an ideal topic for such study.

That apparently is the consensus of opinion among teachers and pupils at Toronto's Alexander Muir public school, where Grade VII stu-

dents have pooled their talents in the school's social study classes and have produced displays of various Hydro projects, which even the graduate engineer might envy.

## Choose Topics

Co-operation was the keynote of this effort of the more than 70 boys and girls, averaging 13 years of age, who produced the models, the maps, paintings and written material, which went to make up the overall story. Projects of this kind get off

to the most democratic of beginnings at Alexander Muir, with the boys and girls themselves choosing the topic and then dividing themselves into groups to study and report upon the various phases of the subject.

Once the subject, power development, was chosen and the different groups were given their assignments, the research began, with libraries, newspaper files, magazines and other information sources as the targets.



## Grade VII pupils of Toronto's Alexander Muir School produce unique displays of Ontario Hydro projects

The required information collected, the boys and girls then got down to the job of writing themes, and it is from these themes that the data were gathered for use in the construction of models and in the paintings, drawings and other displays used to illustrate features of the subject under study.

In preparation for their power development project, the pupils studied the history of electricity in Ontario and gathered information about the important generating stations in the province, paying particular attention to Hydro's great Niagara undertakings and to the St. Lawrence power project. They then put their findings to work and produced models of such stations as the Sir

Adam Beck - Niagara Generating Station No. 2 and the Stewartville G.S. on the Madawaska River, and also produced scale models of the St. Lawrence project.

The St. Lawrence models are their particular pride. Made of a combination of flour paste and plasticine, and enamelled in various shades of green, they show all the towns and islands in the area of the great international development and the course of the river itself is clearly depicted. The models are "before" and "after" replicas, showing the area as it was before the power project was undertaken and after completion of the work.

Other parts of the Alexander Muir display include a large map of

Ontario pinpointing power developments throughout the province, pictures and attached descriptions of generating stations, and pictures and posters illustrating some of the many uses of electricity.

While the highly successful display was, from beginning to end, the work of the pupils, with each contributing in some way toward the finished product, the supervision and encouragement of their teacher, E. L. Gibson, was an important factor, as was the guidance given to both teacher and pupils by D. M. Davis, a social studies consultant with the Toronto Board of Education, and Alexander Muir Principal J. B. Davies. ■

ST. LAWRENCE model in the making. Five of the 70 pupils, who participated in the project, put the finishing touches on the intricate model of the 2,200,000-horsepower development.



# THE LIGHT TOUCH

NIGHTLY ILLUMINATION SPECTACLE IS  
ONE OF NIAGARA'S MAJOR ATTRACTIONS

by  
Horace Brown

THE stage is the whole sweep of Niagara Falls. The backdrops are the twin cataracts themselves. The spectators are the hundreds of thousands who come annually to the Niagara area to see the falls and remain for the second act: the nightly illumination.

Niagara Falls stages this big free show practically unaided. The roaring waters of Niagara furnish the background for the spectacle, as well as the electric power for the huge floodlights used in the illumination of the Canadian (Horseshoe) and American Falls.

An example of international co-operation, the annual budget of some \$20,000 for the project would not be sufficient to produce the first act of a Broadway play. Yet, for tourists from all over the world, this nocturnal presentation provides

one of the most cherished memories of their visit to one of Nature's most remarkable creations. The cost of lighting the falls is shared by Ontario Hydro, which supplies the power for the illumination as its contribution; by Niagara Falls, Ontario, and by Ontario's Niagara Parks Commission for Canada, while Niagara Falls, N.Y., is the sole United States participant. A. S. Robertson, Manager of Hydro's Niagara Region, is the Commission's representative on the Niagara Falls Illuminating Board.

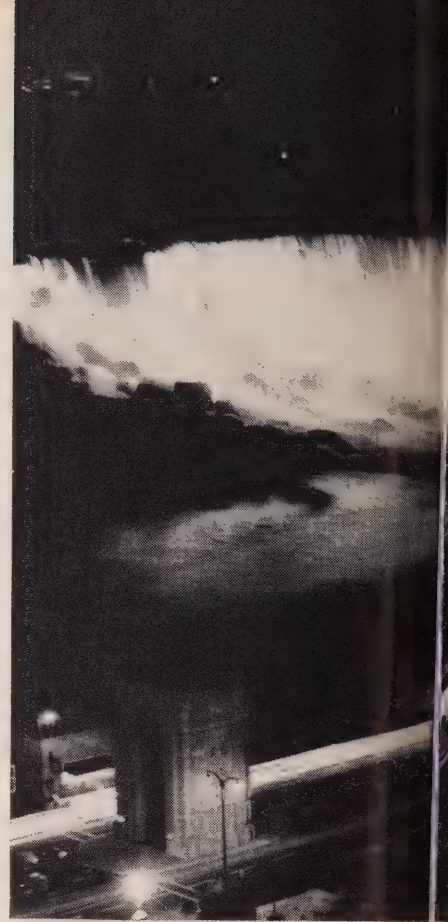
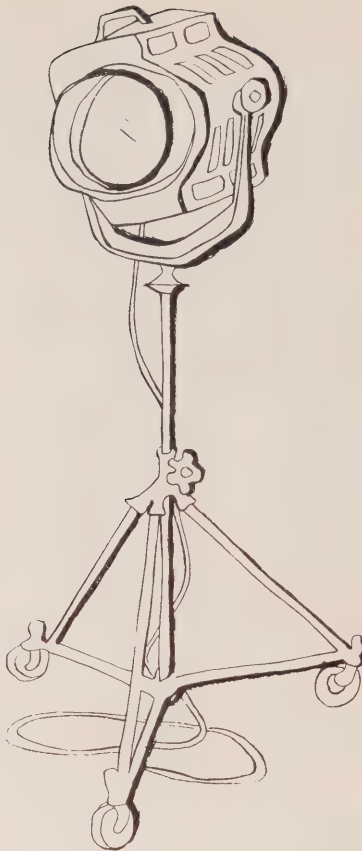
Curtain-time for this "super-Cinemascope" production varies with the seasons. From January 1 to April 15, it starts at 7.30 p.m., Eastern Standard Time; April 16 to 30 at 7.45 p.m.; May, 8.00 p.m.; June and July, 8.15 p.m.; August 1 to 15, at 8.00 p.m.; August 16 to 31, at 7.45 p.m.; the remaining

months of the year, 7.30 p.m. Although its starting-time changes, the show runs exactly two-and-a-half hours before the curtain of darkness is "run down."

White lights play on the falls as an introduction to the nightly drama, which has been running seven nights a week, almost continuously, for the past 30 years and more. This lasts for 30 minutes and then the cataracts become a fairyland as nearly every color in the spectrum is trained upon them. Signalling the finale of each night's show, white is used for the last 30 minutes.

## Eight Color Changes

There are eight changes of color, including red, orange, yellow, blue, green, lavender, purple and magenta, during the summer presentations and six for the winter shows.







△

DURING the 2½-hour illumination spectacle, cars and pedestrians throng Queen Victoria Park at Niagara Falls (Ontario). Niagara Parks Commission officials estimate that 8 to 10 million people will visit the "Falls" district this year.

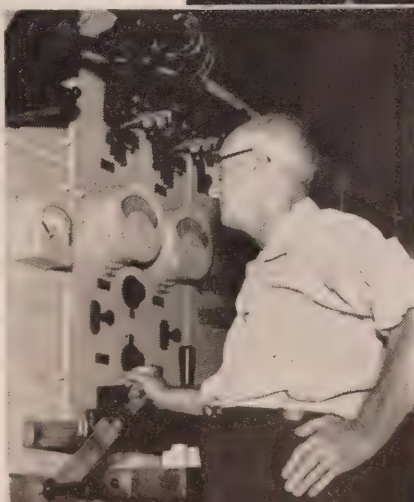
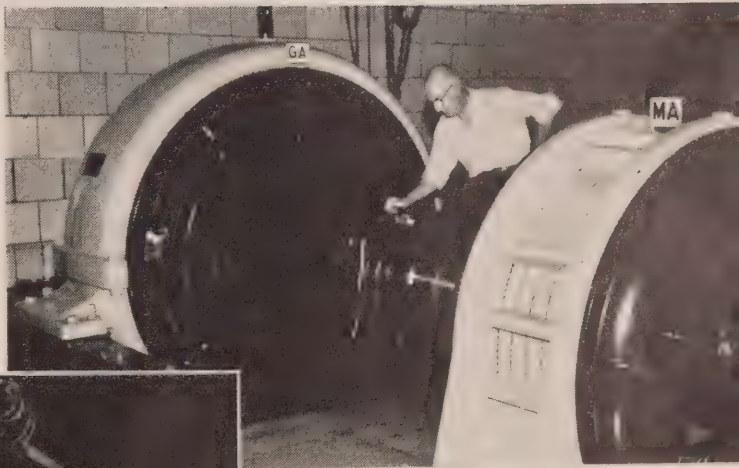
The color effects are achieved by the use of non-inflammable "Cinemoid" screens, three feet square. Some 92 of these screens, cut from larger sheets of the material, are used each year.

While no set pattern is followed, only those colors, or color combinations in many instances, are used, which have produced the most "oh's and ah's" among the throngs who witness the famed "falls painting" ceremonies.

Of course, the tourist sees only the big show itself. The backstage story is equally interesting.

The illumination is provided by large floodlights, situated on the roof of the surge tank of the Commission's Ontario Power Generating Station, 45 feet above the Niagara Parkway. Facing both catar-

(Continued on Page 16)



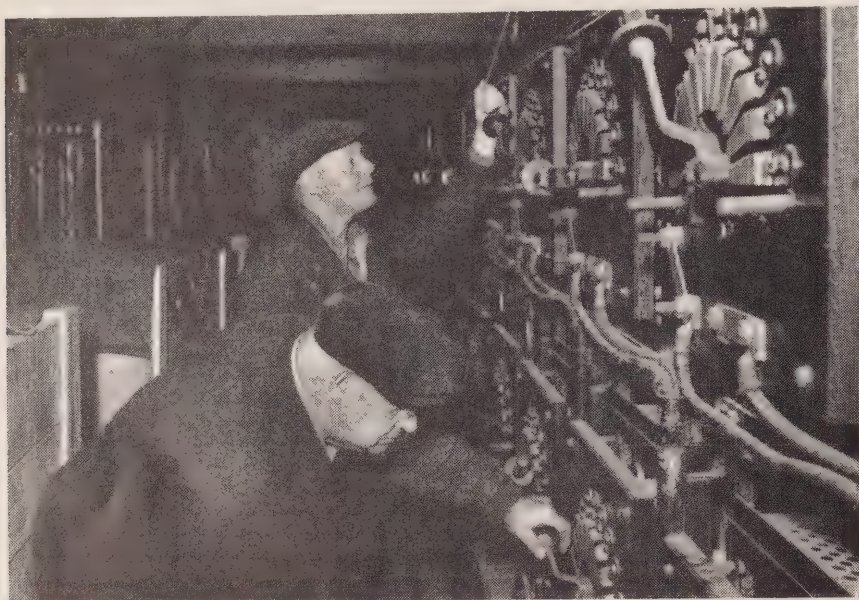
LIONEL Edwards (left photo), first operator at Hydro's Ontario Power Generating Station, throws the control switch of one of two, 250-horsepower generating units (shown above) in the plant, which provide the electricity for the battery of floodlights.



SITUATED on the top of the surge tank of the Ontario Power G.S., the floodlights emit a total of 1,320,000,000 candlepower. ▷



▽  
BACKSTAGE, two lighting experts — Foreman William Rapelje (foreground), and David Rennie switch on the 24 "lamps."



acts, these 24 massive lamps, each 36 inches in diameter, emit approximately 55,000,000 candlepower apiece, being supplied with power by two, direct current generators. The two generators, with a total installed capacity of approximately 500 horsepower, are located in the Ontario Power Generating Station, which nestles at the foot of the Horseshoe Falls. This total of 1,320,000,000 candlepower is played on the falls with the same dexterity as a lighting director cues in his "board" for a stage show.

Designed by the late D'Arcy Ryan, the mechanics of the display have remained virtually the same since opening night of the big show on May 24, 1925. Even the personnel, which is under the direc-

tion of Harold G. Male, Works Superintendent of the Niagara Parks Commission, has varied little. The men behind the lights are William Rapelje, foreman, who has actually supervised the illumination since 1927; David Rennie, who followed a year later, and George Newhouse, who replaced the late Eddie Scheu when the latter died in 1950.

#### Longer Carbons

Possibly the only major change in the backstage arrangement was an idea of Mr. Rapelje's. He noticed that the eight-inch carbons were burning out rapidly under the intense heat generated, leaving a fairly long "stump." He approached the carbon manufacturers with a suggestion for a 16-inch carbon,

which would burn longer. These carbons were made up and are now an essential part of the display. The "inventor" figures they have saved some \$1,000 annually, although the carbons still represent some one-fifth of the budget.

"The carbons, just like automobile carburetors, are set for their own particular lamp, each light consuming 125 amperes."

There have been no major mishaps in the illumination backstage, with the exception of a small fire, which was caused by a short circuit. Ice, formed by spray from the falls, is a hazard in the winter.

"Some cold nights," Mr. Rapelje told *Ontario Hydro News*, "you could put your skates on. Each lamp is like an icehouse. On occasions like this, we sometimes have the lamps on for a half-hour before they start working. One time I had a cold in my chest. I put a towel over my eyes, and stood in front of a lamp. Next day, I had a bad sunburn. It knocked out the cold, but I won't try that again. One thing about it, its always cool up here, even on the hottest summer night."

Particularly appreciative of the part Ontario Hydro played in launching the project, and of its continuing support, Superintendent Male is equally proud of the large audiences his artistry attracts and of the thousands of colorful reproductions of his handiwork sent home annually by admiring visitors. ■



# QUICK CHANGE

With the thermometer soaring above 90 degrees, a corps of some 200 Ontario Hydro line construction crewmen participated in a successful, high-speed line replacement project recently.

Regarded as the biggest one-day job ever handled in the Commission's Western Region, the operation entailed the removal of conductor on a 27.6-kv. low tension line along a 9.5-mile stretch of Highway 7 between Elginfield and Ailsa Craig and the installation of heavier 27.6-kv. conductor.

Only source of electricity for

some 2,000 Hydro customers in the Ailsa Craig-Parkhill district, a few miles north of the City of London, the older conductors had been in service for approximately 40 years. Showing the ravages of time in many sections, necessitating frequent winter repairs, and inadequate for the requirements of increasing loads, the venerable cables were replaced by 4/0 steel reinforced aluminum conductor.

Serving rural and hamlet customers principally, the lines were changed within 12 hours, commencing at 6.30 a.m. Work was sus-

pended temporarily for 90 minutes at noon to allow customers to prepare a warm luncheon.

Under the supervision of Line Maintenance Superintendent F. R. Wilson, the 200-man army of Hydro linemen from various areas of the Western Region, with assistance from crews in the West Central Region (Hamilton), strung the 28 miles (three circuits) of new cable in 4,000-foot lengths. Spanning 366 wooden poles, the new conductors required 39 splices. With 10 line trucks and 18 other vehicles engaged in the quick changeover, the large squad was divided into six crews in order to keep the power interruption at a minimum. The crews succeeded in stringing six sec-

*(Continued on Page 28)*



EAST of Ailsa Craig, members of Hydro's 200-man "task force" string the last section of a 10-mile stretch of the new conductor.

FOUR linemen are engaged in splicing the new aluminum cable, which was strung in 4,000-foot lengths, while another lineman climbs a pole to lend a "hand."



SMALL corps of scientists, technicians and other service personnel perform many important experiments in this building and on the surrounding 10 acres of property. ▷



IN an electrically-cooled storage room, Dr. L. Ward Koch, Officer-in-Charge, examines test tube cultures of plant disease-producing organisms prepared for an experiment. ▽





Electricity and science are an important  
team in this agricultural laboratory

# Farmers' Friends

by HORACE BROWN

**M**ODERN agriculture is big business!

If you doubt that statement, look at the record of farm production in Ontario since 1918, when the total output of the province's farms was valued at about \$595,043,000. Actual figures are not available for 1954 as yet, but they are expected to hit about the same level as 1953 when the gross value of agricultural production was set at \$1,022,501,000.

Despite its successful record of growth, Ontario agriculture is still in a constant battle with a number of hazards, ranging from insects to weather.

Insects and plant diseases are the implacable enemies of the farmer, but fortunately the modern man of the soil has found invaluable allies in the federal and provincial laboratories, which labor on a 12-month basis seeking ways to protect the harvests.

One such research centre is the Science Service Laboratory, operated by the Federal Department of Agriculture at Harrow, Ontario. Its corps of scientists has many notable achievements to its credit in the

constant war being waged to reduce crop losses.

This highly-gearred operation would be impossible without electricity, according to the Officer-in-Charge, Dr. L. Ward Koch. Enjoying an international reputation as an authority on field crop diseases, Dr. Koch reports that the use of electricity is vital to most experiments, and that much of the research would, in fact, be impossible without electrical energy.

The white laboratory building is a familiar and welcome sight in the Harrow district. The staff, which is composed of 12 fully-trained scientists, five technicians and other service personnel, carries out several of its experiments in an adjacent greenhouse, as well as field tests on 10 acres of property surrounding these buildings.

Established in 1938, the Science Service Laboratory has provided invaluable assistance to the farmers, not only of Ontario, but even across the border. For instance, the Harrow scientists discovered a method of controlling the black root in sugar beets—a fungus disease, which was causing incalculable damage to this important crop.

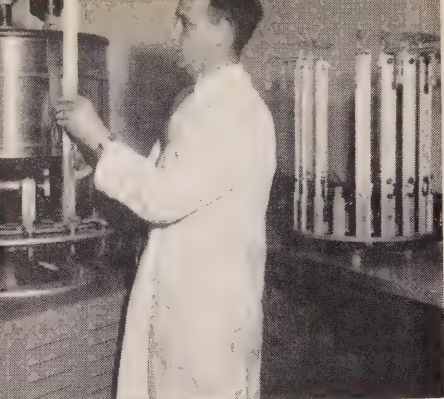
They determined that the disease could be controlled by the application of a chemical fertilizer mixture at the time of seeding. The method has now spread beyond Canada and is being used in the humid areas of the United States, particularly in California. The chemical was dubbed "Thiram," from the initials of its various components, although it is sold under a number of trade names.

## Vegetable Diseases

Further research established that "Thiram" could be adapted for the control of vegetable seedling diseases. One teaspoon of the mixture is now added to a greenhouse "flat," a box for growing of seedlings.

Research at Harrow has also provided controls for a number of serious tobacco diseases, mostly soil-borne. Another notable achievement was the control developed for some of the cucumber diseases. This has brought Dr. Koch and his associates many commendatory letters from grateful farmers of the district, where about 125 acres of this vegetable are grown under glass. Cucumbers, in this area, represent

*(Continued on Page 20)*



DR. Z. A. Patrick, associate plant pathologist, conducts a plant respiration test in the electrically-operated Warburg apparatus.



MISS Anne Hoerberlin, student assistant, uses an electric sprayer to apply an insecticidal test spray to a young peach tree.



LABORATORY technicians Patricia Llewellyn, left, and Harry Thorpe, foreground, use electricity in much of their work. Miss Llewellyn is placing culture media in an autoclave while Mr. Thorpe is making a microscopic analysis during a soil experiment.

a cash crop of about \$3,000,000 annually.

Investigations have been undertaken to determine the cause of many plant diseases such as pod and stem blight, stem canker and brown stem-rot in soy beans. Black and brown root rot and blue mold attacking Ontario's valuable tobacco crops have received attention, as well as diseases affecting seed corn and sweet clover. Special consideration is also being given to causes of and remedies for the "peach replant" problem. This is the name given to the decline or failure often experienced by growers who set out young peach trees on the site of peach trees, which have been cut down, due to age or other reasons.

These are just a few of the many plant investigations made by the lab. in the past 17 years. In the entomology section, research has been directed toward obtaining economic control of the major insect and mite pests, which ravage peach and other fruit crops, as well as those attacking vegetables grown under glass. This involves studies of life histories, seasonal cycles and abundance and also the biology and habits of the various pests and of all their important natural enemies. The effects of weather on populations of the pest species and of the beneficial organisms attacking them are investigated, too, as are their complex inter-relations.

Such studies provide basic information in determining appropriate control measures, as well as the timing and extent of these measures. For instance, the destructive oriental fruit moth came in for much attention as far back as 1948. The introduction of parasites gave satisfactory, although not complete control of the moth in a number of orchards. This method of destruction was augmented when experiments with both DDT and parasites were tried. Certain parasites were found to be unaffected by DDT and these were distributed in the orchards; the orchards were then sprayed with the chemical. This means

of reducing the moth population has had a valuable effect in combatting damage. Similar experiments are now being made on the European red mite and the two-spotted spider mite. Because of the unstable nature of insect and mite populations, continuous research is necessary.

### Handmaiden of Science

In all these research programs, which benefit the farmer, electricity is the handmaiden of science. Most of the laboratory and greenhouse experiments at Harrow must be carried out under conditions of constant light and temperature. These conditions are maintained by numerous electrical appliances.

Batteries of electrically-operated constant-temperature ovens are used, enabling the scientists to study the temperature requirements of disease-causing organisms. It has been found that some of these organisms prefer high temperatures; others flourish in low temperatures. This gives the scientist "a line" on methods of destroying these organisms, which cost the farmer money.

Electric soil-heating cable is used for investigation of soil-borne diseases. It also plays a part in determining the harm caused by insects.

Fluorescent lighting fixtures are employed in the laboratory for

(Continued on Page 21)

DR. W. B. Mountain, left, and Dr. Koch examine special plug-in connections for heaters and cooling equipment in the laboratory's new constant temperature tank room.





## POWER COMES TO PELEE

(Continued from Page 7)

ties in relating the history of Pelee to the mainlanders and telling of the advantages of its southern clime (it's the southernmost point in Canada); the value of its soybean crop and the internationally - famous pheasant shoot, which attracts thousands of hunters to the island every fall. The people of Pelee have always been optimistic about the future of their island, and now that Hydro has come to Pelee, with all its many blessings, they report that they face the future with even greater confidence.

—by J. G. Murphy.



## ST. LAWRENCE TOUR

### FARMERS' FRIENDS

(Continued from Page 20)

plants requiring constant temperature and moisture. Equipped with electric timing devices, the fluorescent fixtures simulate daylight, thus making studies of their growing habits more intensive. This electrical application, Dr. Koch said, is essential for investigations into the relationship of diseases to crop plants.

Another important use of electricity is to steam and disinfect soil. The disinfected soil then becomes part of the experiment, with disease organisms deliberately added for study under various conditions. This provides a number of checks and enables the assessment of injuries to plants caused by diseases.

In the spotless, well-appointed laboratory, electricity and its uses are ever-present. While the scientific equipment may prove somewhat bewildering to the layman, it is easy to understand the importance of lighting, the cold storage rooms, and the small research rooms where light and heat are electrically-controlled and humidity is kept to a minimum.

#### Electrical Equipment

Clean test-tubes and bottles are

THREE representatives of the Eastern Ontario Municipal Electric Association paid a visit to Cornwall recently where they were guests of Hydro during a tour of the St. Lawrence Power Project. The group is shown standing on the pontoon bridge, which joins Barnhart Island and the U.S. mainland at Hawkins Point. The 4500-ft. steel cofferdam is visible in the background and all the water of the St. Lawrence is passing under this bridge. The E.O.M.E.A. officials toured the project with C. G. W. MacIntosh, Hydro Information Officer. In the group from the left are: Ernest V. Dyke, Smiths Falls, President; George Baldwin, Lindsay, First Vice-President; Mr. MacIntosh, Dr. R. A. Patterson, Kemptonville, Second Vice-President, and William Langdon, Lindsay, former Warden of Victoria County.

essential to scientific work, and the Harrow laboratory washes its bottles with an electrically-operated revolving brush, while autoclaves are used for a variety of sterilizing operations. A Warburg apparatus measures the respiration of plants and plant tissues, providing one indication of plant health. High speed centrifuges, special electric heaters, constant-temperature tanks where experimental work on soil-borne troubles can be carried through on a yearly basis, electrically-operated ventilation in the greenhouse and many other applications of electricity are in constant use in the laboratory and greenhouse.

While a power failure during research would be disastrous, Dr. Koch said no experiment has ever been ruined in this manner. P. A. (Bud) Lawson, Hydro's Harrow Area Manager, emphasizes that the Commission recognizes the importance of the laboratory. A new line was constructed two years ago in the vicinity of the laboratory, while the building is only a short distance from two substations.

The years to come may bring even more startling developments at this important agricultural research centre, with science and electricity working together as the farmers' friends. ■

# TORONTO HYDRO RECOLLECTIONS



THE late E. M. Ashworth is shown as he replied to the numerous expressions of esteem, which he received on his retirement as Toronto Hydro's General Manager.

**E**MINENT engineer and administrator, the late Edward M. Ashworth was one of the key figures associated with the building of Toronto's electrical system for a period of 40 years.

When he retired in 1951 after 30 years as the General Manager of the Toronto Hydro-Electric System, it ranked as one of the world's largest municipally - owned electrical utilities.

From this vantage point, Mr. Ashworth has recorded his impressions of the growth and achievements of the Toronto System, as well as many of the notable figures who were prominently identified with the founding and history of the publicly-owned Ontario Hydro enterprise.

Before his death in 1954, Mr. Ashworth had completed a 224-page volume of memoirs to which he gave the title "*Toronto Hydro Recollections*."

Published a few weeks ago by the University of Toronto Press, the book has received warm critical acclaim. In a recent issue, William Arthur Deacon, distinguished Literary Editor of the *Toronto Globe and Mail*, devoted almost two columns to a review of the book.

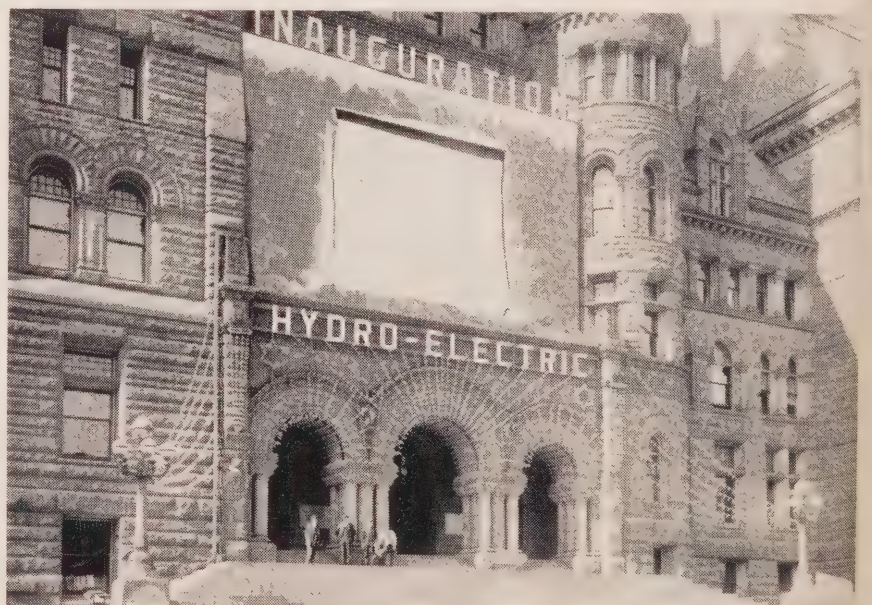
Mr. Deacon's penetrating review is reprinted in part herewith:

"Hydro supplies the light by which this article is written and will supply the presses with power to print these words, also heat for the breakfast toast and power to move people downtown on the subway; yet it is a taken-for-granted factor in our lives. Leading servants of publicly-owned utilities do not explain often nor lucidly to the public they serve. A closed mouth never lost a man a job. But the late E. M. Ashworth, who served the Electric Commissioners for 40 years — for 30 of those years as general manager — broke silence on his retirement in 1951, and before his

death in 1954 compiled a popular history of the enterprise, which is human and modest. The great virtue of *Toronto Hydro Recollections*, however, is that it presents all the essential facts in language that can be understood by anybody.

"What revelation this little book affords and based on what good sense! Adam Beck's ruling idea back in 1902 was cheap light for homes and service at cost. How well this ideal has been lived up to is shown by the figures. In 1912, Toronto Hydro was purchasing from Ontario Hydro at \$18 per horsepower year; and by 1951 the

(Continued on Page 28)



MR. ASHWORTH'S book recalls that dignitaries on the platform for the inauguration of Hydro service in Toronto (May, 1911) were drenched with water when the replica of Niagara Falls accidentally overflowed.





# This and That

## Canada And Electricity

Today, electric motors are performing a multitude of tasks in practically every Canadian industry from Vancouver to Halifax. Most of their functions are of an everyday nature, but now and then a unique application comes to light.

That's the case at Black Lake in Quebec where 50 million tons of asbestos-containing ore lies beneath 50 feet of water and 30 million cubic yards of clay, sand, gravel and silt.

To get at the deposits, the lake will be drained and helping to do the job will be two, 6,000-horsepower motors, an 800-horsepower unit and associated controls and switchgear.

The mud and water will be pumped to a disposal area three miles away, after a river running into Black Lake has been diverted. On a dredge, powered by the 800-hp motor, a device similar to a propellor will stir up the lake bottom and then the 6,000-hp units will power the pumps doing the disposal job. It is estimated that the operation will take about three years to complete.

Another example of the many ways in which electricity serves Canada.

\* \* \*

## Origin Of "Hydro"

We are greatly indebted to D. C. Thomson, Secretary-Treasurer and Manager of Grimsby Hydro-Electric Commission, for sending us a clipping telling something about the man who introduced the word "Hydro" into the English language.

He was John Smedley, a wealthy English hosiery manufacturer. When he became ill, he went to Ben Rydding in Yorkshire (according to the newspaper clipping), where he underwent a new, cold-water cure, which had been introduced into Britain around the year 1840. The cure consisted of drinking quantities of cold water, taking cold baths or having wet packs applied to the body — hence the derivation of the word "hydropathic" from the Greek noun — "hudor" pertaining to water.

Returning to his mills at Matlock in Derbyshire, fully cured, he began to acquire property in the vicinity so that his workers could enjoy the benefits of the water cure. Soon some 2,000 patients were being treated at the Matlock "Hydro," while animals were used as guinea-pigs as well. The popularity of the treatment is said to have restored the declining fortunes of the town.

John Smedley died in 1874, but the word "Hydro" which he is said to have given to the world—with all its beneficial implications — still flourishes.

\* \* \*

## Power, Mathematics And The Bottle

A visit to a bottling plant can sometimes have unexpected results, aside from the possible effects of the liquid concerned. During a tour of such an establishment in Ontario recently, municipal and Ontario Hydro officials were impressed by the efficiency of the various assembly lines — all of which were electrically-operated — and the question, naturally enough, arose as to what the power load of the plant was and what part of the cost of this load was involved in the bottling of one unit of the particular refreshment. The problem was turned over to a Hydro man equipped to deal with such matters; and he — also naturally enough — came up with the answer. The plant, it seems, turned out an average of 39,000,000 bottles of thirst-quencher each month. Relating this output to the plant's cost for electric power, and by doing the various things which only mathematicians can, our Hydro man came up with the following announcement: the cost of electricity per bottle was 1/90 of one cent.

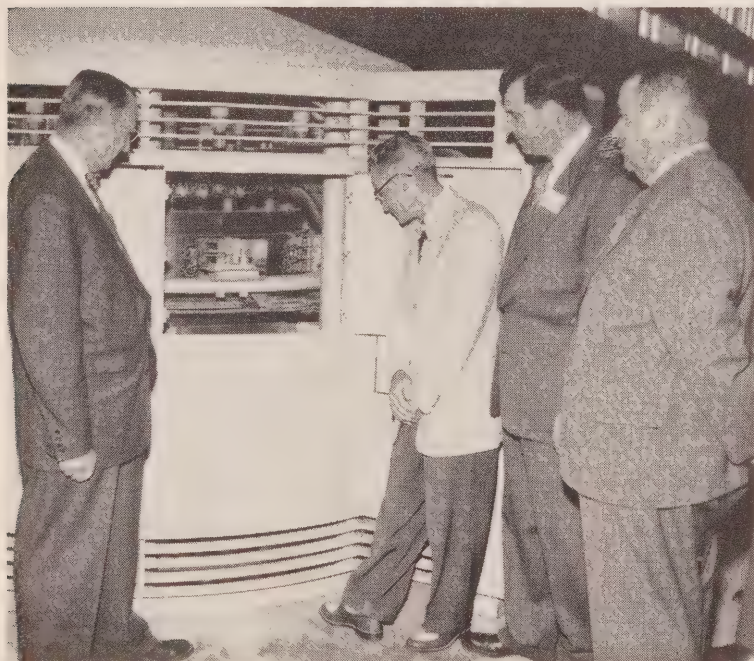
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## Incidental Intelligence

This month most Canadian municipalities return to standard time. It is perhaps of interest to note that Canada was the first country in the world to adopt the standard time system that is now in universal use . . . Quebec City's first street lights burned fish oil as fuel . . . About one-third of Saskatchewan's electrified farms draw their power from wind generators.



**CENTURY "PLANT"** - An added glow was provided for this year's centennial celebrations in the City of London, Ontario, by this unique century "plant" created by London P.U.C. artists. Combining wood, metal and plastic in its construction, the plant had 200 yellow and green electric "flowers," which furnished attractive illumination at the intersection of two main city thoroughfares during the event.



**MUNICIPAL VISITORS** - Ontario Hydro, through Manager A. S. Robertson and staff members of the Niagara Region, played host to District 5 O.M.E.A. delegates at their recent summer general meeting at Niagara Falls. Delegates were taken on a tour of Ontario Hydro installations in the Niagara Falls area, including a visit to the powerhouse of the Sir Adam Beck-Niagara Generating Station No. 2. The photographer found these four delegates, left to right: T. W. Houtby, Welland; Claire Lampman, Fonthill; Cecil Swayze, Welland, and Gordon Klager, Fonthill, examining the "innards" of an exciter for one of the plant's new units, of which 12 are now in service.



# ALONG HYDRO LINES



## Honor Clinton P.U.C. Employee

A record of public service dating back to 1914 was recognized recently, when members of the Clinton Public Utilities Commission gathered to honor retiring Assistant Superintendent A. E. Rumball. Mr. Rumball was presented with a wristwatch and an occasional chair by the commission and the employees. "Forty-two years is a long time in any business," noted P.U.C. Chairman W. E. Perdue, who paid tribute to Mr. Rumball at the retirement dinner.

## Ottawa Hydro Plans New Service Building

Ottawa Hydro Chairman Stanley Lewis announced recently that the commission has called tenders for construction of a Hydro service building on the Albion Road, and awarded contracts totalling \$104,-096 for construction of a control building at the Overbrook station and for purchase of cables and duct lines on St. Laurent Boulevard.

## First Commercial Nuclear Electricity

Electrical history was made recently near Schenectady, New York, with the production of the first nuclear-created electricity for commercial use. Some 10,000 electric kilowatts, the by-product of a submarine atomic engine undergoing tests in a 20-storey steel sphere, were delivered into the system of the Niagara - Mohawk Power Corporation, at a cost of three cents—payable to the United States Atomic Energy Commission — for every 10 kilowatthours of energy delivered to the company. While not the first electric power to be produced by nuclear fission, it is the first to be distributed for commercial use.

## Expansion Planned By Oshawa P.U.C.

Oshawa Public Utilities Commission expects to add between 400 to 500 new customers to its books during 1955. Requirements of new housing subdivisions, and for commercial expansion in the city, is expected to increase the demand for power in 1955 by about 4,725 kilowatts.

## London P.U.C. Chairman Named to Water Committee

Long an advocate of a provincial water commission, Dr. Clifford Reason, Chairman of the London Public Utilities Commission, has been appointed to the Ontario Water Resources and Supply Committee, established a few months ago by Ontario Premier Leslie M. Frost, it was announced recently. Dr. Reason is also a member of the Southwestern Ontario Water Resources Committee. Other members of the committee, which has been created to study the question of providing adequate water supplies for western Ontario municipalities, include: Chairman A. M. Snider, Waterloo; B. L. Bedford, Chatham; W. D. Conklin, Kingsville, and J. A. Vance, Woodstock, a Past President of the Engineering Institute of Canada.



S. E. PRESTON

## Kitchener P.U.C. Manager Named Transit President

Stuart E. Preston, Kitchener, was elected President of the Canadian Transit Association at its recent annual meeting held at Jasper, Alberta.

A member of the executive for some years and, until his recent appointment, Vice - President, Mr. Preston has been actively interested in transportation since he became General Manager in 1944 of the Kitchener Public Utilities Commission, which operates the Kitchener-Waterloo transportation system.

The new President is well-known in the electrical world, having joined Ontario Hydro in 1923. He served with the Accounting and Municipal Audit Departments until his appointment in 1941 as Controller of the Kitchener utility. He became General Manager three years later.

An accountant by profession, Mr. Preston was born and educated in Toronto, and served with the 48th Highlanders (Reserve) during World War II. A member of the K-W Granite Club and Westmount G.&C.C., his principal recreation is golf.

## Ottawa Hydro Breaks All Records

A record gross surplus of \$1,400,160 during 1954 by the Ottawa Hydro-Electric Commission highlighted the report presented by Chairman Stanley Lewis to the annual general meeting of the commission and Ottawa City Council.

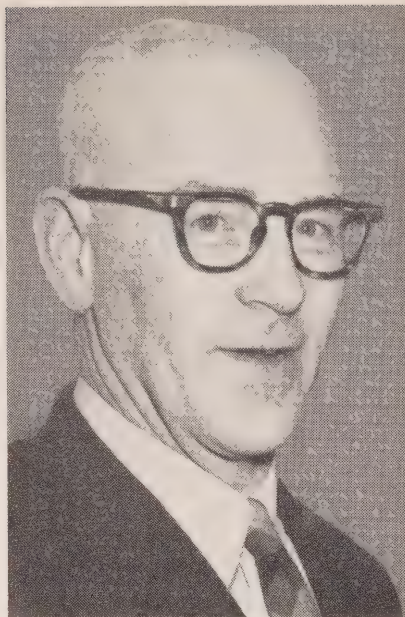
Remarking it was "about the best report that has ever been made," Mr. Lewis said conditions generally showed improvement in 1954; the gross profit was up by \$178,828, more customers were served and capital assets increased.

A graph of peak loads and other data indicated that if the present rate of increase continues, the system could double its present size within the next seven years, while a schedule showed that changes in rates over the past 25 years have been negligible, in spite of the tremendous expansion.

Other important facts dealt with: **ASSETS:** At December 31, 1954 — \$16,951,796; At December 31, 1953 — \$15,613,404; **EARNINGS:** 1954 — \$6,437,049; 1953 — \$5,980,582; **OPERATING EXPENDITURES:** 1954 — \$5,036,888; 1953 — \$4,759,250; **CAPITAL EXPENDITURES:** 1954 — \$1,323,832.60; 1953 — \$1,023,642.00; Customers served, as of December 31, 1954, totalled 66,978, an increase of 2,751 over 1953. (By April 30, 1955, this figure had jumped to 67,801.) In 1954, 15,832 customers changed addresses.

Operating cost per customer in 1946 was \$52.61, while in 1954 it amounted to \$77.12, yet for 83 percent of Ottawa customers, the rates have remained the same. During 1954 the Ottawa Commission reduced the debenture debt by \$294,000, leaving a balance of \$5,600,000. During 1954, 1,212 new type luminaire street lights were installed, representing an increase of 532 over 1953.

Electrical bills ranged from \$1.50 for two months, to \$873,230 annual



F. O. ROBINSON

## Port Arthur Mayor Accepts P.U.C. Post

Mayor F. O. Robinson has tendered his resignation as Chief Magistrate of Port Arthur to accept the newly-created post of personnel officer of Port Arthur Public Utilities Commission.

Mr. Robinson has been Mayor of Port Arthur since 1949, with the exception of the 1952 term. A Canadian National Railways machinist by trade, he has also been active in provincial affairs, having sought and won election to the Ontario Legislature in 1943 and 1945, and again in 1948.

Commenting on the new P.U.C. appointment, Chairman Samuel Ashton said that, in making the choice from among a large group of applicants, the commission had been "fully aware of Mr. Robinson's wide experience in labor circles, as well as of his municipal and legislative background."

for the Canadian Government. The Commission paid the city \$120,755 in municipal taxes, while the payroll of \$1,300,766, constitutes an increase of \$80,833 over 1953.

## Buy Water Heaters On Instalment Plan

Hydro customers in Owen Sound are now able to buy electric water heaters on the instalment system. In accordance with a plan devised by the Owen Sound P.U.C., the local commission will act as a wholesaler for the city's electricians and plumbers, and finance heaters over a 12-month period. The plan has two advantages in view of the fact that the increasing number of electric water heaters gives the utility additional control over the system peak load, and enables customers to buy heaters without having to pay for them outright.

The P.U.C. owns 179 of 804 water heaters now on control, which, together with the control equipment, amounts to an investment of \$24,559.00. Resulting savings from controlling the water heater load of 500 kilowatts on the peak approximated \$34.25 per kilowatt per annum or \$17,125 annually on the entire cost of power. Cost of operation and maintenance of the control equipment was \$2,548 in 1954, which meant a net saving in that year's operations of \$14,577 on an investment of \$24,559.

## Appoint Rehabilitation Information Officer

Malcolm E. Bradden has been appointed Hydro's Rehabilitation Information Officer for the St. Lawrence Power Project. For the past several years, Mr. Bradden has been on the staff of the Commission's Information Division.

With headquarters in Morrisburg, Mr. Bradden will be responsible for providing information on all phases of rehabilitation work in communities to be relocated as a result of the power project. His duties will also include assistance to families being relocated so that the rehabilitation program may be carried forward in a smooth, efficient manner, and with a minimum of inconvenience to those concerned.





**NORMAN A. GRANDFIELD**

General Manager of Galt Public Utilities Commission, who has been named General Manager of Brantford Public Utilities Commission. Mr. Grandfield, a former A.M.E.U. President and one-time Assistant Manager of Brantford P.U.C., will succeed W. R. Catton, a well-known member of the Hydro fraternity, who is retiring on October 1 this year.

### **Cobourg P.U.C. To Light Cairn**

A cairn at Cobourg, commemorating the first world ploughing match will be something to see — by night as well as by day — thanks to a recent decision of the Cobourg Public Utilities Commission. The commission agreed to undertake the lighting of the cairn and, in the words of Commissioner Mayor J. D. Burnet, to "keep the light burning."

### **Stratford Plans Building Program**

Stratford Public Utility Commission has instituted an approved renovation and building program this year involving the expenditure of approximately \$164,000. The building plans include a new municipal substation, improved street lighting, extensions and improvements to the electrical system and alteration of office facilities.

### **Veteran Superintendent Retires at Waterloo**

Recalling the days when Waterloo received its electricity from waterwheels and steam generators, Eby Rush, Superintendent of Waterloo P.U.C., retired recently after 45 years' service. Mr. Rush is being retained in a consultant capacity, while Ivan Bradley, his assistant for the past 14 months, has been named Superintendent.

Supporting a widowed mother, Mr. Rush started his Hydro service life at New Hamburg when he was 17 years old. He was employed as operator of New Hamburg's steam-operated electrical plant for over two years, leaving to become a line-man at Waterloo in 1910. As one member of the two-man operating staff, he witnessed the purchase of the local system by the municipality from a local flour mill for the sum of \$23,000. Mr. Rush was appointed Superintendent over all departments in 1939, succeeding Manager George Grosz with whom he had served from 1910. During his long association with the Waterloo Commission, Mr. Rush saw the system demand grow from 125 to approximately 14,000 horsepower, while the staff now consists of 24 employees.

### **Fort William Announces Lighting Program**

A new lighting program of approximately 266 units at Fort William, at a cost of \$63,380, has been undertaken by the local Hydro Commission at the request of the city council. This program will extend new lighting in the city by some 8½ miles this year.

### **Named Commissioner**

Richard Henderson has been appointed as a member of Kemptville Hydro-Electric Commission to fill the vacancy caused by the recent death of Commissioner James Carmichael. Mr. Henderson, a well-known local resident, is a former member of Kemptville municipal council.

### **Superintendent Modernizes Control Panel**

A manually-operated, flat rate water heater control panel, one of the first installed in the province, has been rebuilt by the St. Marys Public Utilities Commission for automatic operation at a material cost of \$220.00, representing only a small portion of the cost of replacement by a new panel. Working mostly in his spare time, P.U.C. Electrical Superintendent Gerald Near modernized the control panel using parts purchased by the P.U.C. and other unusual parts which he supplied. The panel, installed at a local substation, is used to cut off water heaters during peak load periods. Chairman G. H. Glover said the modernized system would save considerable money by controlling the local commission's peak load without the expense of operators.

### **Install Escalators At Maple Leaf Gardens**

Installation is proceeding at Toronto's Maple Leaf Gardens of four reversible escalators, which will move patrons at the rate of 20,000 an hour.

Prior to construction, re-organization of the electrical system was necessary as the escalators occupy positions, which formerly accommodated the arena's generating room, lighting and ventilating remote control panels. To prepare for the shafts, hundreds of conduits, cables and wires had to be moved, as well as two 200-hp. generators, each weighing several tons.

This \$170,000 improvement will reduce by an average of 60 percent the stair climbing of blue, green and grey seat patrons. Escalators are expected to be in operation in time for the Shriners' circus this month.

Loyalty is a major force making for unity in any life — even in the existence of a civilization . . . It gives point and flavour, most of all meaning, to a life or a culture.

—Harmon M. Gehr.

## TORONTO HYDRO RECOLLECTIONS

(Continued from Page 22)

city organization was paying the provincial organization \$23.57. Over that same period of 40 years Toronto Hydro had been able to reduce its charge to customers from 2.01 cents per kilowatthour to 1.06 cents.

"Domestic users have always had service at less than cost, which meant charging commercial and industrial users more than cost. There are 35 different rates now in use. When it was proposed to charge everybody the same, Mr. Ashworth thought it a wise simplification, since goods would cost less to make and sell and the householder could buy things cheaper. But there was a general feeling that homes should pay less; and so the matter stands.

"How closely 'service at cost' has been maintained is seen in the fact that, after providing for replacements, there was only \$4 million in general reserve in 1951, and this represents less than one percent of revenue received.

"Toronto Hydro-Electric's legal status, which is little understood, is here set out with utmost clarity. It is a sort of department of the city's business, with the mayor always one of the three commissioners.

"Adam Beck was the leader in a war for public ownership and against private ownership. One of his weapons was the power of the (provincial) government to provide capital funds and legislate adverse legal action out of existence, and it was only by stirring up pressure by the municipalities that he could get the government to go along with him. His other weapon was electricity at rates that would put the private interests out of business.

"Sir Adam Beck got the municipalities 'absolutely behind him,' and Toronto's adherence was his chief strength in the struggle.

"That the plan has worked is shown by sale of 35,176,548 kilo-

watthours in 1912, and 2,061,790,-741 in 1951.

"Water heaters were a device to get around the financial peril of the peak load. Mr. Ashworth explains that the rules compelled Toronto to pay the Ontario Commission on the basis of the highest rate of consumption during any 20-minute period in the month. As demand varied greatly by the time of day, water heaters at low cost were promoted to use power during slack periods and were subject to suspension whenever the load neared maximum. Other factors make them less useful now to the Toronto system, but citizens insist on this convenience.

"The labor relations chapter is particularly interesting since a strike would stop this city dead — no subway, lights, electric stoves, washing machines and most industry idle. Mr. Ashworth turned the problem over to W. F. Sutherland, 'a choice on which I never ceased to congratulate myself.' The essence of Mr. Sutherland's solution was co-operative committees of employees and management to decide on the actual value of each person's work. With this was joined the training of employees for promotion and better pay.

"Putting wires underground is another timely topic. To do the whole job now would cost \$225 millions. Mr. Ashworth favored placing heavy wires underground for public safety and getting rid of ugly poles with cross-bars. This would only cost \$45 millions. Since the small concrete poles must remain to carry street lights, they might as well distribute low voltage current to dwellings.

"All the key figures are appraised — some, like P. W. Ellis with deep admiration, others with charitable restraint. There are many touches of humor, such as the author's \$9 a week salary when he was already a graduate engineer, and the orig-

inal plant at Iroquois that had one water-wheel and no governor.

"Most graphic is the ceremony of turning on the first Hydro power in Toronto, shortly after 8 p.m., May 2, 1911. After a dinner at the King Edward, the dignitaries marched to the city hall, where a miniature replica of Niagara Falls had been constructed over the front doorway. To be realistic, a stream of actual water would pour over the pictured falls as soon as the lights went on. Then there would be speeches.

"Adam Beck pressed the button, but there had been some miscalculation about the water. It gushed out and drenched the dignitaries on the platform. They went inside for the speeches; and this was no loss to the crowd because loudspeakers had not yet been invented." ■

## QUICK CHANGE

(Continued from Page 17)

tions of new line during the morning and seven during the afternoon and evening.

Although the entire project ran slightly beyond its schedule, due to breakages in the older conductors and trouble encountered in stringing around corners, the affected customers demonstrated a keen appreciation of the problems involved and of the new era of better service, which this temporary interruption presaged. ■

## Classified Ads

### FOR SALE

1 — C.G.E., 25-cycle, 10-kva, 2200-volt, 6.6-amp., constant current transformer, serial no. 2075339 — rebuilt in 1940.

1 — C.G.E., 25-cycle, 10-kva, 2200-volt, 6.6-amp., constant current transformer, serial no. 1911987 — rebuilt in 1942.

Any inquiries should be addressed to: Manager, Scarborough Public Utilities Commission, 1750 Kingston Rd., Toronto 13, Ontario.





## FALLS EXPLOIT

**H**arry Green, Ontario Hydro geologist, works in a "bucket" seat suspended from a crane halfway down the 162-foot face of the Horseshoe Falls at Niagara. Carried out in accordance with the strictest safety precautions, the operation was necessary in plotting the profile of the rock undercut to determine the most satisfactory position for a retaining wall to be built above. Excavations are being carried out on both Canadian and American flanks of the falls by Ontario Hydro and the U.S. Army Corps of Engineers to improve the flow along the crest. One of the requirements of the Niagara Diversion Treaty of 1950 between Canada and the United States is to preserve and enhance the beauty of the Horseshoe Cataract. To accomplish this, an area about 100 feet along the crest of the falls and the same distance upstream on the Canadian side, with the shoreline as the third side of the triangle, will be filled in with rock and enclosed by a concrete retaining wall. The fills on each side of the river will serve as vantage points for closer observation of the spectacle by the many tourists who visit Niagara.

## BRUSH WARFARE

*(Continued from Page 10)*

inated in time. Some species of woody plants, including birch, sumac, poplar and willow, can be wiped out with a single spray; others, such as hard maple, basswood, hickory and oak, are resistant and may require two or three sprays. It is considered safe to predict, however, that the brush will be so reduced — if not entirely eliminated — after three sprays, applied over a 10-year period, that the cost of plant growth control will show an impressive reduction. This is in contrast to right-of-way areas where brush has been cut periodically for the last 20 to 30 years and the plants are still there ready to sprout again after cutting.

The amount of money saved is, in itself, sufficient to justify this method of vegetation control, but there are other fringe benefits accruing. The following statement appears in the "Arborists News" of January, 1953: "Game management men who have given any thought to this matter will agree that the presence of brush along roadsides for game cover has been over-emphasized. This cover is not only a hazard to the motorists, but to the game as well, and all we have to do is count the bodies of game birds and animals along the roadside to convince ourselves. The removal of tall growing woody species always results in other species succeeding. The herbaceous weeds and grasses, which follow this removal of woody plants, produce more food in form of seeds and vegetation than was represented by the original woody plants.

"The removal of brush from cross-country power and telephone lines creates additional acres of fringe area as described by game management representatives as 'being very desirable and essential for propagation of game birds.'"



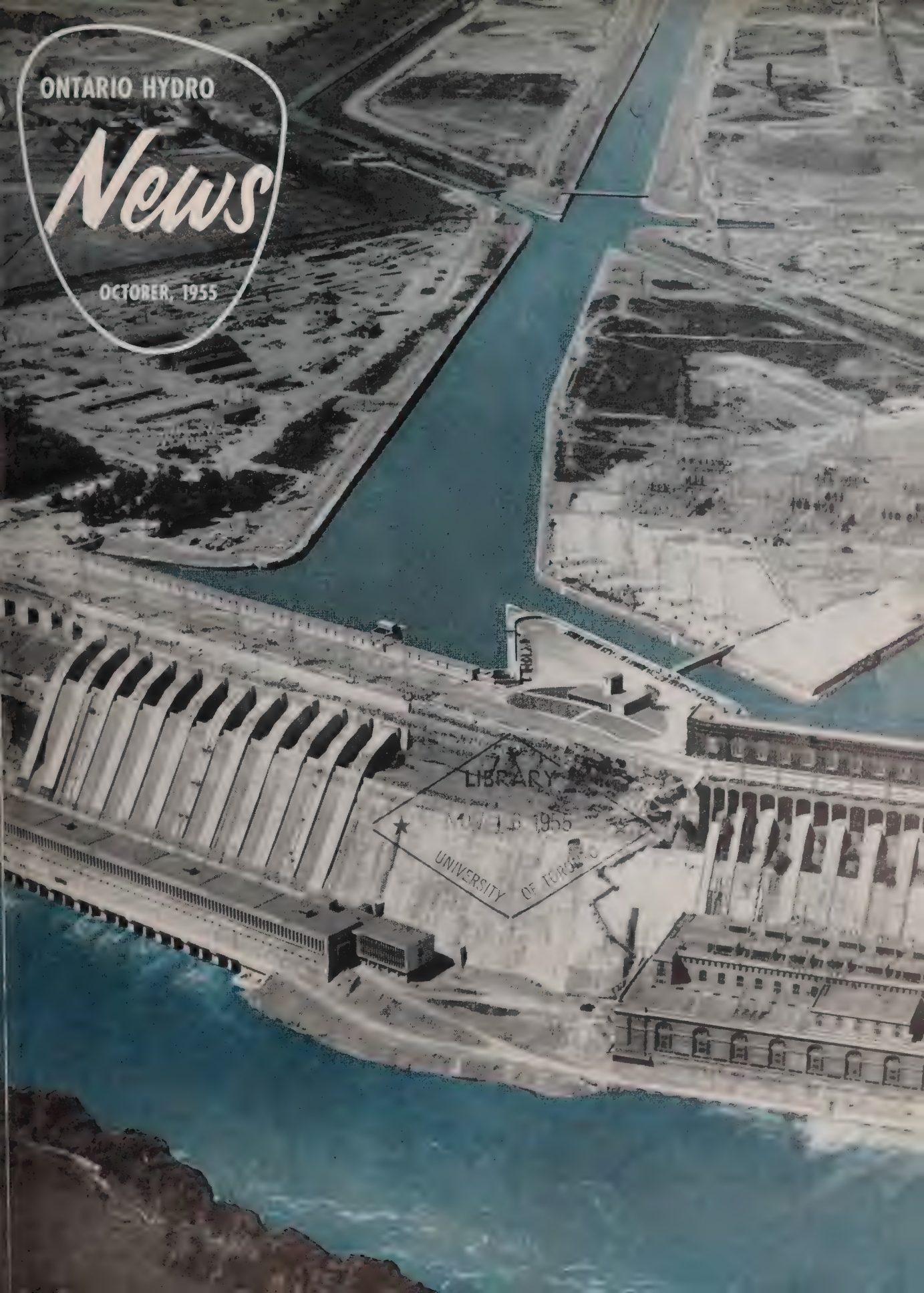




ONTARIO HYDRO

# News

OCTOBER, 1955





October, 1955

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## SALIENT FACTOR

AS INDICATED in the next column on this page, our front cover this month salutes the recent completion of the first phase of construction at Ontario Hydro's Sir Adam Beck-Niagara Generating Station No. 2 project. The present installed capacity of this plant (1,200,000 horsepower) and its ultimate destiny as a 1,828,000-horsepower giant, assure it of a pre-eminent role in the Commission's system and in the economic future of this province. Recognized as the largest power development ever constructed by the Commission, it is one of the major reasons why Ontario Hydro was able to report at the end of 1954 that the total dependable peak capacity of its province-wide system stood at 5,543,000 horsepower — an increase of 113 percent over the 1945 figure.

While such a record of expansion is significant and undoubtedly encouraging to Ontario citizens, it is well to realize that completion of the initial phase of this great Niagara project is just another step in the Commission's plans to develop every economically-feasible power source in this province, as well as forming important interconnections with the systems of neighboring utilities in Canada and the United States.

Elsewhere in this issue, for instance, the reader will find evidence of construction progress at the St. Lawrence Power Project near Cornwall, which will have a profound effect on the power resources of Ontario. This issue also makes reference to the Commission's decision to proceed with the construction of another northwestern Ontario project — the Whitedog Falls Generating Station on the Winnipeg River.

Such an impressive augmentation of the electrical resources of this power-hungry province has been signally recognized by the latest edition of "Ontario Industrial Review," published by the Trade and Industry Branch of the Ontario Department of Planning and Development, which observed that "low-cost hydro-electric power has always been one of the salient factors supporting Ontario's growth."

This fact-filled publication also reports that from 1949 to 1954, over 390 new industries have been established in Ontario alone by persons or companies from Great Britain, the United States, West Germany and other countries abroad. Looking to the future, the Review voices the expectation that the civilian employed population will increase at least 440,000 by 1963. "This means," the report continues, "that on the average every year, during that time, manufacturing industry must invest \$480 million. In short, the challenge to be met by industrial development in this province is that of maintaining a rate of expansion even greater than the rate achieved during the past eight years."

It is gratifying, therefore, to note indisputable evidence that the Commission is laying plans for progressive increases in generating capacity, thus assuring the availability of ample blocks of power for industrial development as required.



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OUR front cover this month shows the companion Sir Adam Beck - Niagara Generating Stations No. 1 and No. 2 and is intended as a salute to the recent completion of the first phase of the No. 2 station (left), which was officially opened on August 30th, 1954. With a present installed capacity of 1,200,000 horsepower and an ultimate capacity of 1,828,000 horsepower, it is the largest power development ever built by Ontario Hydro.

Typical of the beauty of the Ontario countryside at this season of the year is the peaceful autumn scene on the back cover.

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**RUBBER COLOSSUS:** Changing this tire alone might prove quite a task for even the huskiest male. This "rubber-wonder" forms part of one of the rear wheels of a huge, house-moving machine, now working on the relocation of homes at Iroquois, Ontario, to be affected by flooding for the St. Lawrence Power Project

(see Village On the Move—Page 2). Equipped with oversize, pneumatic tires to almost completely absorb road shock caused by uneven surfaces, each wheel assembly stands almost 10 feet high and weighs approximately 4,000 pounds. In case of a "flat," it would take three hours to re-inflate the big, home-toting tires.



# VILLAGE ON THE MOVE

**Newsmen witness house-moving at Iroquois  
during St. Lawrence Power Project tour**

ONTARIO'S historic Village of Iroquois is literally "on the move."

The picturesque St. Lawrence community, lying in the path of the gigantic St. Lawrence Seaway and Power Project, has started its trek to a new townsite, north of the present location, but still within its existing corporate limits.

On September 19 this year, Ontario Hydro gave more than 150 newspaper, radio and television representatives from many parts of the province an "on-the-spot" demonstration of its plan for re-establishing the village's 1,100 residents on the selected site.

During a special inspection tour

AERIAL VIEW OF THE PRESENT SITE OF IROQUOIS VILLAGE







△ JUST before the house left its original site in "old" Iroquois, this group (left to right): Ontario Hydro Chairman Dr. Richard L. Hearn, Gladys Roberts, Mr. and Mrs. C. A. Roberts, and Hon. W. K. Warrender, Vice - Chairman, exchanged "bon voyage" wishes.



△ ENROUTE to its new location, 1½ miles north, the Roberts home—securely placed on the massive, house-moving equipment—prepares to cross a railway line.

of construction progress on the St. Lawrence Power Project, the large group saw the home of Mr. and Mrs. C. A. Roberts (Mr. Roberts is an employee of Caldwell Linen Mills Ltd., the village's major industry) lifted from its foundations by massive house-moving equipment and transported from its location on Wellington Street to Lot 195 on Caldwell Drive in the new town-site, a distance of approximately 1½ miles.

### Two-Hour Job

One of the first houses to be moved in Iroquois, which will completely disappear as a result of flooding for the St. Lawrence Power Project, the Roberts home was on its new foundations, with electrical, water and telephone services operating normally, two hours after it had left its previous site. So "smooth" was the trip, in fact, that members of the Roberts family, with Dr.

Richard L. Hearn, Ontario Hydro Chairman, and other guests, were able to remain "on the premises" while the house was in transit.

Simple as it sounds, though, the streamlined operation was the net result of careful planning and personal direction by the contractor, James Hartshorne, and it demonstrates the challenge involved in rehabilitating other communities in the next three years. In all, some 6,500 Ontario residents in the St. Lawrence Valley will be affected by flooding operations, which will not begin on a major scale until 1958.

### Two Machines

In the house-moving operations, two machines are used — one capable of lifting loads up to 200 tons and the other capable of lifting 100-ton loads. Both machines are electrically-operated, having their own 200-horsepower diesel generator



△ HYDRO, telephone and water services were connected immediately after the house was placed on its new foundations. Within a few minutes normal living was resumed.

units. Perhaps the most spectacular part of the machines are their wheels. The rear ones stand nearly 10 feet high and are three feet wide. Huge pneumatic tires are used, which almost completely absorb road shock caused by uneven surfaces. Each wheel assembly weighs approximately 4,000 pounds.

A home is prepared for moving by first building a steel frame underneath the sills and the load-bearing sections of the house. When this is completed, the house, in effect, sits on a huge tray or float. The house-moving machinery is then backed into position to pick up the frame or float. To lift the house free from its foundations and, at the same time, to keep it perfectly level, three winches are positioned at the three, load-bearing points on the machine. A master control, which operates the three lifting mechan-

(Continued on Page 4)





△  
TOURING points of interest in the St. Lawrence Power Project area, Ontario newsmen viewed the unwatered channel of the river — site of the two large powerhouses.

HYDRO'S highest transmission towers, built to support cables spanning the river and the present ship channel near Cornwall, form the background of this photograph of newsmen inspecting a 4,500-foot steel-cell cofferdam used to unwater the powerhouse area.



isms simultaneously to effect a balanced lift, is used. On reaching the townsite, the house is lowered on to its new foundation, which has been prepared in advance. The combination of a solid frame, giving support to the house wherever it is required, together with being carried in suspension and the large shock-reducing tires, permits a home to be carried at its normally level position without twisting or jarring.

But this was not the only large piece of machinery that the party saw during the tour of the 35-mile stretch of the great river "highway." Commemorating, in a sense, the official launching of the joint Ontario Hydro-Power Authority of the State of New York project on August 10, 1954 by Prime Minister Louis St. Laurent, Ontario Prime Minister Leslie M. Frost and the then Governor of New York State, Thomas E. Dewey, the party climaxed the visit to the Iroquois area, where they received an official welcome from Reeve Lloyd C. Davis, by viewing the Iroquois Dam site.

At this point, a structure, 2,540 feet in length and 67 feet high, will be built to regulate the outflow of

water from Lake Ontario.

Highlighting the tour of the construction sites, which were described by Hydro officers from a "P.A."-equipped station wagon, was the afternoon visit to the work areas of the Ontario powerhouse, Long Sault Dam and the Hydro project hospital. Much interest was shown in the 4,500-foot long steel-cell cofferdam, which was constructed across the north channel of the river, between the Canadian mainland and Barnhart Island, to permit work on the two powerhouses to proceed in the dry. Attention was focussed, too, on the unique, retractable Bailey Bridge structure across the Cornwall Canal, at Lock 19, designed and built by Ontario Hydro engineers, to move heavy equipment and machinery to the powerhouse area from the Canadian mainland without interrupting water traffic. Associated with the unwatering of the powerhouse site, is a smaller cofferdam, which sealed off the north channel between Sheek and Barnhart Islands. Contractors are now engaged on excavations in the powerhouse area.

Moving upstream from the loca-

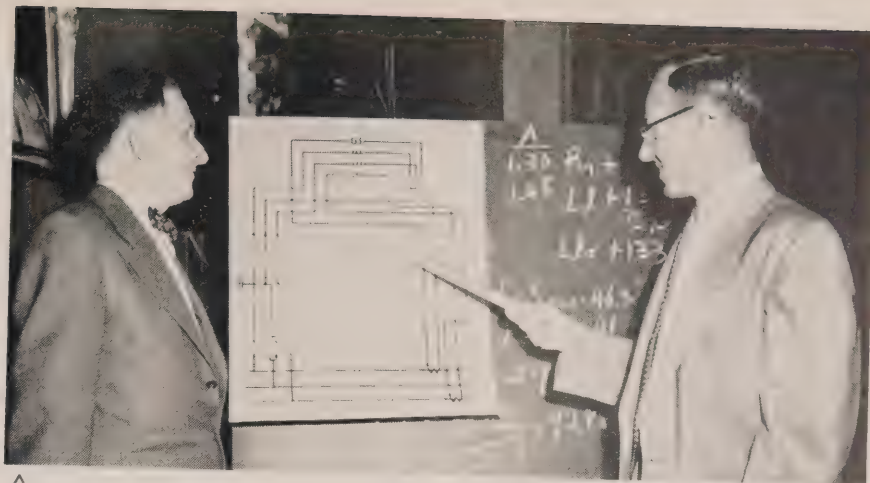


tion of the generating stations, the group viewed, at first-hand, progress on the Long Sault Dam, which is being undertaken by the Power Authority of the State of New York. The dam will extend from the western end of Barnhart Island to the United States mainland. The 2,250-foot long structure will serve to control the level of water in the headpond, allowing, as necessary, any excess amounts to bypass the powerhouses.

### Project Hospital

The day's tour concluded with a visit to the Hydro project hospital, situated just off No. 2 Highway, about two miles west of Cornwall. The two-storey frame building, the group learned from Dr. John McIntyre, Medical Officer, has many of the latest medical and surgical facilities of a large institution. It is equipped to handle most accidental injuries and illness cases, which may occur on the job. Built by Ontario Hydro forces, the hospital well demonstrates the thoroughness and the foresight which have gone into all aspects of the Commission's planning for this great power development.

Participating in the tour were key officials from both Ontario Hydro and the Toronto Hydro-Electric System. They included: Dr. Hearn, Ontario Hydro Chairman; Hon. William K. Warrender, Q.C., and W. Ross Strike, Q.C., Vice-Chairmen; Lt.-Col. A. A. Kennedy, Commissioner; A. W. Manby, General Manager; Dr. Otto Holden, Chief Engineer; Gordon Mitchell, Director, St. Lawrence Power Project; Harry Hustler, Director of Property; James A. Blay, Director of Information, Ontario Hydro, and officials of Toronto Hydro — including Bertram Merson, Chairman; John McMechan, Vice-Chairman; His Worship Mayor Nathan Phillips, Commissioner, and H. J. MacTavish, General Manager. Representing the New York Power Authority were: William H. Latham, Resident Engineer and Luther Cliffe, Assistant Resident Engineer. ■



T. H. LEWIS, Supervising Meter Engineer, Western Region, Ontario Hydro, right, used this diagram to illustrate his address. H. E. McBroom, Toronto Hydro, is shown on the left.

## HONAN HEADS METERMEN

WITH a total of 118 delegates registered at the recent fall meeting, Central Ontario Meter Association set an attendance record for the past five years. A capacity audience filled the Canadian Legion Hall at Port Credit as delegates elected a new slate of officers for 1955-56. T. J. Honan, New Toronto Public Utilities Commission, was installed as President of the association. During the morning session the delegates heard an

interesting paper on "Field Tests on Power Metering," delivered by T. H. Lewis, Supervising Meter Engineer, Western Region, Ontario Hydro. The afternoon schedule included an illustrated address by R. T. James, Meter Division, Ferranti Electric Limited, and a special "quiz" panel, which provided answers to many questions relating to meters and metering. Delegates voted the sessions both interesting and profitable. ■



NEW officers of the Central Ontario Meter Association: Seated, left to right, Lionel Blaker, Belleville, 2nd Vice-President; T. J. Honan, New Toronto, President; T. G. Martin, Etobicoke Township, Secretary-Treasurer; standing, from left: Stanley Trodd, Orillia, 1st Vice-President; V. H. Bailey, Toronto Township H.E.C., and T. R. B. Morgan, Toronto Hydro, both Directors.

# FOR TODAY AND

A distinguished pioneer in the municipal utility field, Brockville Public Utilities Commission added another page to its long record of civic service on August 30 with the official opening of a new office and service building.

Hailed by the town's Chief Magistrate, Mayor John W. C. Langmuir, D.F.C., as "another milestone of progress," the handsome, functional structure is located on spacious, commission-owned property in the heart of a rapidly-expanding area of the bustling Thousand Islands municipality.

Replacing quarters in the Victoria Building, in an older section of Brockville, the new building brings

the offices and service departments of the Brockville Commission under one roof for the first time.

Built entirely from the recent current revenues of the commission's electrical department, the new headquarters combines many of the latest architectural and structural features of design for the operation of the commission's electrical, water and gas facilities.

## Two-level Structure

Constructed of steel, brick and concrete, set off by Indiana limestone, the fireproof, two-level building faces on Front Avenue opposite the recently-completed office and service building of Ontario Hydro's Brockville Operating Area.

A canopied entrance opens into a public lobby and large general office. Equipped with modern appliances and office furnishings, this section of the building also provides space for executive offices, a billing-room, and the engineering and drafting departments. Maintenance shops, meter rooms, stores department and other facilities are located on the lower floor of the main office building. A modern, heated garage for utility trucks adjoins the main building.

Reflecting the municipality's rapid expansion, the new office and service building was officially opened by W. Ross Strike, Q.C., and Hon. H. A. Stewart, only living Commissioner of the first Brockville Commission.

Indicative of the local significance of this event was the presence of a

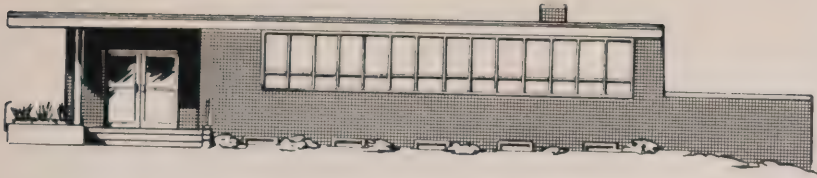
HON. H. A. STEWART, member of Brockville's first commission, flanked by Mayor J. W. C. Langmuir (left), and W. Ross Strike, Hydro's Vice-Chairman, cuts ribbon.



CANOPIED entrance opens into the lobby and general office of the new building, which accommodates all departments of the utility.







# TOMORROW

large group of Brockville citizens at the inauguration ceremonies, while congratulations were extended to the local commission by representatives of Ontario Hydro and neighboring municipal utilities, the Ontario and Canadian Governments, as well as executive officers of the O.M.E.A. and A.M.E.U.

In his brief address, Mayor Langmuir said the new building is a manifestation of the town's rapid growth in the past few years "and I venture to say that this expansion will be even more rapid in the future."

## Advancement Ground

Located in the centre of the town's "advancement ground," the building presages a new era of commercial and mercantile development, Mayor Langmuir stated.

While the new building is a reflection of the town's growth, its completion is due, in great measure, to the unselfish work of Brockville commissioners, the speaker pointed out.

"We should, at this moment, recall with gratitude the almost herculean efforts of such men as Chairman Henry Walter, who has given 28 years' service to the citizens of Brockville."

Mr. Walter, who ably participated as master of ceremonies during the inauguration event, then called upon W. Ross Strike to officially open the building.

In acknowledging Mr. Walter's introduction, Hydro's Vice-Chairman added his tribute to the Brockville Chairman, comparing his career of public service to the records of two

other "Hydro stalwarts" — the late W. S. Reynolds and Alex Farquharson (the latter was Manager of the Brockville utility for 29 years, retiring in 1951 a few months prior to his death).

"In my 22 years' association with utilities work, I have been increasingly encouraged by the calibre of the people associated with this type of public service in Ontario," Mr. Strike stated.

Brockville, he said, is one of the pioneers in the municipal public utility field and has been fortunate in having attracted good employees and community leaders, "who gave their time unstintingly in the development of the utility and the municipality which it served."

## Financial Position

In dealing with Hydro's financial position, the speaker pointed out that the strength of the entire, province-wide organization is due, in a large measure, to the healthy condition of such utilities as Brockville.

Stressing the importance of maintaining this position in the future, Mr. Strike referred to the expansion of Ontario Hydro and municipal utilities in the past decade.

It has been necessary for Ontario Hydro to borrow approximately

*(Continued on Page 8)*

MARKING 50 years' service as a utility employee, Byron C. Serviss, stores foreman, right, received a certificate of merit from Manager H. W. Little.



FORERUNNER of the Brockville P.U.C., the Brockville Gas Works was taken over by the town in 1900. Brockville Commissioners, left to right, W. W. Ashworth, Chairman Henry Walter, J. R. Philips and F. C. Curry examine plaque preserved in the new building.





\$100,000,000 every year for the last 10 years to finance this billion-dollar program of expansion, he said.

"We have had no difficulty in doing so because Canadian and United States investment organizations have the utmost confidence in our financial structure."

This healthy condition is largely the result of careful auditing of accounts and strict adherence to the principle that "all revenue from the use of electricity must be held in trust for the users of electricity."

Declaring that "this building is built for expansion," Mr. Strike voiced Ontario Hydro's confidence in the future of Brockville. This confidence, he said, is based on the municipality's steady growth in the past 15 years.

### Increased Consumption

"Since 1941, the town's average monthly domestic consumption has more than doubled, while industrial utilization has almost tripled."

Brockville, he continued, is typical of many Ontario utilities, whom he soundly congratulated on their demonstrated ability to keep pace with increasing electrical demands.

Turning to the question of the province's power resources, Mr. Strike emphasized the significance of Ontario Hydro's growing power grid.

Already, the Commission has important interconnections with the Detroit Edison Company system at two points along the border, as well as with the Niagara Mohawk Power Corporation.

"We hope to establish a better interconnection with Hydro Quebec, as well as a new connection with the Manitoba Power Commission in the near future."

On a smaller scale, but of equal importance, is the interconnection between the Commission's Southern Ontario System and the Northeastern Division.

*(Continued on Page 22)*

IN his new office, Manager H. W. Little (seated), discusses a problem with Floyd McRae, Brockville P.U.C. Secretary.



TREASURER Manley Miller (standing), and James E. Shields, cashier, with Miss Ethel Grant, right, hold a brief conference in the general business office of the new building.



SPACE for the utility's trucks and other service equipment is provided in the large garage adjoining the main building. Provision has been made for additions to the two-level building.



# NEW CHAPLEAU CHAPTER

Northern Ontario Community  
Joins Ontario Hydro System



△  
INSPECTING a new Ontario Hydro generating unit installed to augment Chapleau's power supply, this group (left to right): H. R. Graham, Manager, Northeastern Region; George Fife, J. W. Austin, and James Austin, all of Chapleau, pause for a moment to discuss this northern community's growth.

◁  
DURING the public gathering marking the event, H. R. Graham (standing), officially welcomed Chapleau into the Hydro family.

CHAPLEAU, a bustling Northern Ontario community, officially observed the beginning of a new phase of municipal history on September 15 this year with gala "Hydro Day" celebrations.

Held to mark the town's affiliation with Ontario Hydro's growing system, the day-long ceremonies were featured by film showings to school children, climaxed by a civic dinner and a jubilant public gathering in the evening.

The significance of Chapleau's association with Ontario Hydro's province-wide transmission and distribution system was emphasized by the presentation of films and a brief address by Harold K. Hillier, Hydro Information Division representative, for the town's public, separate and high school pupils.

## New Generating Unit

Officially representing the Commission on this occasion were H. R.

Graham, Manager, and A. B. Hayman, Consumer Service Engineer, Northeastern Region, North Bay, and P. R. McAdam, Area Manager, Sudbury, who inspected Ontario Hydro's new Chapleau Generating Station, which houses a 500-horse-power diesel generator. A. J. Grout, a former Councillor of Chapleau Township and now Chairman of Lady Minto Hospital, presided as master of ceremonies at the civic dinner and public meeting which was followed by a dance and entertainment sponsored by Chapleau Township Council.

## Steady Growth

This latest change in Chapleau's electrical status is indicative of the steady growth in power demands since 1909 when James McNiece Austin began serving a few homes in the small hamlet from his tiny power plant.

Since 1910, one man particularly,

George Fife, has managed the town's electrical services, which have been taxed to the limit on many occasions by the expansion within the community.

## Distribution System

Now an important railway centre, Chapleau has purchased the distribution system of the Chapleau Electric Light and Power Company. Although the entire output of this company's generating facilities is being purchased by the municipality, Ontario Hydro has installed a new generating unit to provide additional power for the town's steadily-increasing requirements.

In extending his congratulations to Chapleau citizens on behalf of Ontario Hydro, the Manager of the Northeastern Region, Mr. Graham, traced the history of power development and transmission in Ontario and stressed the importance of the town's association with the rapidly-expanding Commission system. ■



# FROM THE WORLD'S FOUR CORNERS



By *ALLAN A. JONES*

**Scouts of 68 nations tour Hydro developments at Niagara**

"Vite! Vite!"  
"Geschwind!"  
"Dese Usted Prito!"  
"Come on, Chaps!"

In French, German, Spanish, English — in practically every language but Esperanto in fact — the admonition to "hurry" echoed around Ontario Hydro's famed floral clock at Queenston a few weeks ago.

The international visitors were the 11,000 or more Boy Scouts from the four corners of the globe, who visited the unique timepiece during the World Scout Jamboree at nearby Niagara-on-the-Lake.

The visit to the floral clock was one of the highlights of the Scout bus tours of Ontario Hydro developments and other historic points in the Niagara area on four successive days of the ten-day Jamboree.

The young tourists had, of course, a special interest in the impressive out-



"THREE Coins in a Fountain" has been suggested as a title for this photograph of South African Scouts throwing coins into the ornamental pool at the base of Hydro's floral clock. Charles Groom, 75-year-old Scout leader in the centre, has a notable record of 45 years in Scouting to his credit.



door timepiece because of the Scout motif incorporated in the design of the clock's summer face this year, but their enthusiastic reaction to the world's largest floral clock, indicated by their youthful impatience to reach the floral wonder ahead of fellow-Scouts from other buses, was typical of thousands of other visitors.

Typical, too, was their custom of photographing the clock from every conceivable angle, recording a memory of the Jamboree that will go into scrap books and other records in countries from Poland to Pakistan.

Many of the boys also followed the now almost-traditional custom of dropping coins in the ornamental pool at the base of the clock. Though they may not have realized it at the time, those Scouts, who contributed coins, were doing their "good turn for the day," since the money in the pool is collected at the end of the season and is given to the Greater Niagara Community Chest. A substantial amount now goes to this good cause every year.

The clock was not the only Hydro point of interest the world Scouts saw during their four days of touring in the area. From their buses, they also viewed Hydro's massive new Sir Adam Beck Niagara Generating Station No. 2, the older No. 1 plant, at Queenston and the open-cut portion of the canal leading from the twin 5½-mile tunnels built under the City of Niagara Falls to convey water to the turbines of the two stations. They wound up the day's visit to the famous Falls themselves, where many of them watched the tumbling, roaring cascade for the first time. Here, too, they saw Hydro workmen busy on the Canadian flank of the Horseshoe Falls, carrying out part of the remedial and preservation program now well underway at Niagara.

(Continued on Page 29)

▷ **INTRIGUED** by their first view of the Niagara Falls, these sturdy French Scouts took a particular interest in Ontario Hydro's share of the important international remedial and preservation project now underway along the Canadian flank of the Horseshoe Falls.

▷ **TO ADD** color as well as furnishing identification, each sub-camp at the Jamboree had a special entrance, the entrance for "A" Troop of the Toronto contingent being sponsored by the Toronto Hydro-Electric System. Scouts representing seven nations, including, left to right, T. W. Corner, leader of "A" troop, and others from France, Korea, India, United States, Wales, Canada, and Scotland are shown examining an Indian coin.



▷ **TWO** Australian Scouts, who took time out from their Jamboree activities to visit Hydro's new Sir Adam Beck—Niagara Generating Station No. 2, are reading the plaque in the reception area commemorating the harmonious labor-management relations that existed during the construction period.







**Hydro Building Model**

**Gives C.N.E. Visitors**

**Interesting Preview**

**of The "Atomic" Age**



LORD ROWALLAN, Chief Scout for the British Commonwealth, in Canada to attend the eighth World Scout Jamboree, officially opened this year's Exhibition.

# PARADE OF PROGRESS

**H**UNDREDS of Canadian National Exhibition patrons who visited the Hydro Building this year received their first introduction to the "atomic" age.

Emphasizing the 1955 C.N.E. motto, "Canada's Parade of Progress," was Ontario Hydro's animated model of a nuclear-electric power station, supplemented by charts and other models portraying the production of electricity from nuclear sources.

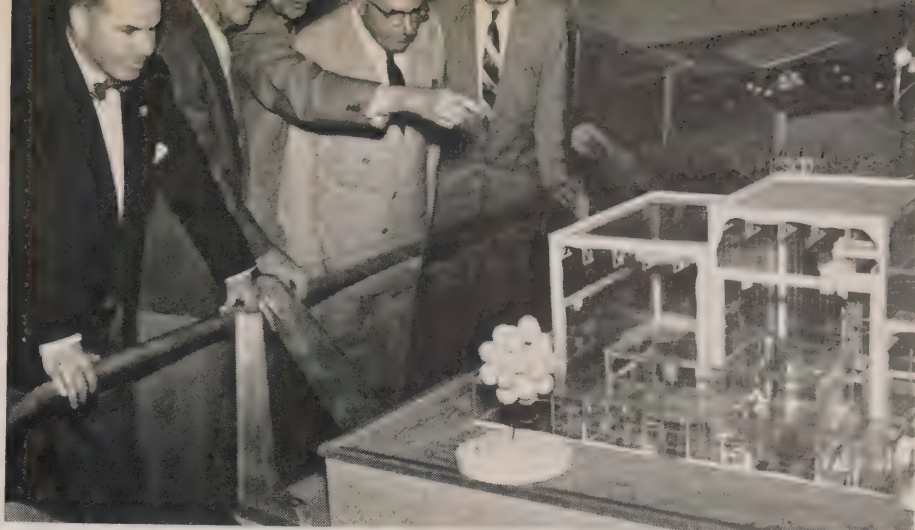
Presented by the Commission, in conjunction with its partner, the Toronto Hydro-Electric System, the graphic Hydro displays told the story of the generation, transmission and distribution of electricity in Ontario. Focussing attention on the Commission's province-wide operations were models of a hydro-electric generating station and two of its major projects; a modern electrified farm; a "before-and-after" map of the St. Lawrence Seaway and Power Project, and a push-

button question-and-answer panel relating to Hydro's vast frequency standardization program. Two colorful exhibits were featured by the Toronto Hydro-Electric System — the "Magic Mirror" and the "Parade of Appliances" — vividly demonstrating modern electrical living.

The first of its kind shown in Canada, and among the first in the world, the model of the nuclear power station naturally attracted a great deal of attention. The clear



CIVIC and provincial dignitaries pay close attention as J. A. Blay, Hydro's Director of Information (pointing), explains the various features of the Commission's model of a nuclear-electric plant. Left to right are: Alfred Cowling, M.L.A. (Toronto-High Park); Toronto Controller David Balfour, Mr. Blay, Mayor Nathan Phillips, and Toronto Hydro Vice-Chairman John McMechan.



ANOTHER view of the model of the nuclear power plant with Hydro Information Officer R. J. Cooksley describing the "modus operandi" to a group of the many visitors who displayed special interest in this particular exhibit.



plastic walls of the animated replica permitted an unobstructed view of the interior. Visitors were able to follow the action of the uranium fuel from the time it is put into the reactor, or furnace, of the plant until the steam is produced to turn the turbo-generators to produce electricity. The three water systems of the plant — heavy and ordinary water, and hot heavy water — were shown in different colors, with the flow indicated by moving bubbles.

"Cutaways" showed the working parts of the reactor and the generating room, which accommodates the turbo-generators, condenser and other equipment. Other three-

dimensional models associated with this nuclear display included one of an atom, one of a nucleus, and one of a neutron splitting an atom (the occurrence known as nuclear fission). In addition to the various models, the display contained a large schematic drawing, which provided a step-by-step description of the nuclear-electric plant's operation. A large background map indicated the location of Ontario's uranium fields.

#### St. Lawrence Project

Vying with the nuclear display for attention were the popular Niagara

(Continued on Page 14)



THIS junior visitor, Bobby Archer, Caledonia, Ont., was caught by the camera trying to fathom the mystery of the nucleus of an atom. Reliable reports indicate that young Bobby outstared the atom, nucleus and all.





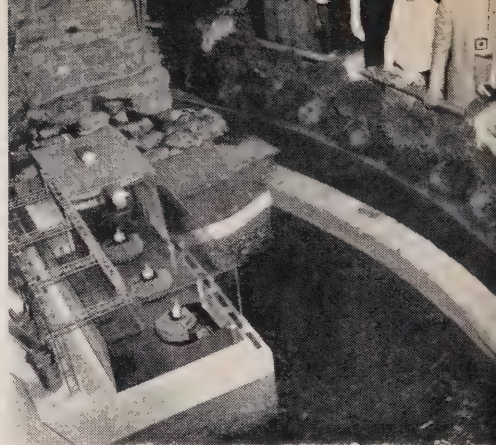
HYDRO'S St. Lawrence Power Project display drew large crowds. Here a group listens as Information Officer L. L. Mullen describes the development "before and after."

and Stewartville models and the model of the St. Lawrence Power Project, all playing return engagements at the Exhibition. The St. Lawrence display was highlighted by a "before-and-after" animated map of the power project area and a model of the St. Lawrence River, which showed, at a glance, how 2,200,000 horsepower will be harnessed in the turbulent International Rapids section of the river between Iroquois and Cornwall. By means of the animated map, the visitor could, with the push of a button, see the "before-and-after" aspects of the huge project for which the ground was officially broken in August, 1954, and from which the first power is scheduled to flow in the summer of 1958.

Other features of the St. Lawrence display included replicas of dams, some of which are now under construction, models of the two large powerhouses, enlarged aerial photographs of the project area, and

a large 15-foot oil painting of the area as it will appear when the power and seaway projects are completed.

The Niagara display brought home to visitors the fact that Niagara, in addition to being a celebrated honeymoon centre, is also one of the world's great hydro-electric power centres. Built in natural color, with simulated water rushing down the Niagara River and plunging over the Horseshoe Falls, the scale model of the Falls and the immediate area included replicas of Hydro's Sir Adam Beck-Niagara Generating Stations No. 1 and No. 2. Visitors also saw the twin 5½-mile-long tunnels that carry water under the City of Niagara Falls at the rate of 15 million gallons a minute from intakes two miles above the Falls. They saw, too, how the tunnels surface and empty into a 2¼-mile long open-cut canal leading to the forebays of the two powerhouses six miles downstream from the Falls. An-



HUNDREDS stopped to examine the working model of the Stewartville Generating Station on the Madawaska River demonstrating power generation at a hydro-electric plant.

other feature of the display was the replica of the 750-acre lake, which Hydro is creating as a reservoir for 650,000,000 cubic feet of water to operate the 228,000-horsepower pumping generating station, which will be placed in operation in 1956.

The realistic working model of the Stewartville Generating Station on the Madawaska River, near Arnprior, also came in for a great deal of attention. The model faithfully reproduces the appearance of the huge dam, which, in reality, rises from the river bed to a maximum height of 206 feet and bridges the 1,300-foot gap between the cliffs on both sides of the river. The actual powerhouse structure, whose height is roughly equivalent to that of a ten-storey building, is dwarfed by the massive dam towering above it.

The Stewartville model included a scale reproduction in plastic of one of the three 14-foot diameter penstocks. Visitors were able to watch the water rushing down this penstock and entering the scroll case with sufficient velocity to turn the miniature turbine.

### Hydro on the Farm

Farmers and others from rural areas had a particular interest in Hydro's intricate scale model farm, which was also making a repeat appearance at the big fair. Built to





△  
COMMISSION model of the Niagara district, one of the world's greatest power centres, draws the interested scrutiny of this group. The model included replicas of the Sir Adam Beck — Niagara Generating Stations No. 1 and 2 and the "Falls" remedial project.

△  
RURAL and city folk alike demonstrated a keen affinity for "farm life" as represented by the model of an electrified farm in the Hydro Building while G. Clare Burt explained the numerous benefits electricity can provide in the rural areas.

a scale of one-half inch to one foot, the model — approximately 6 feet by 7 feet — represents a farmstead measuring 144 feet by 160 feet and a barn 40 feet by 68 feet. The purpose of the model, complete with such time-saving and labor-saving devices as milking machines, hay driers, portable feed bins, stable cleaners and silo unloaders, was to show visitors, farm folk and city folk alike, some of the more than 400 ways in which electrical energy lightens the chores and saves time by speeding up various farm operations.

The Hydro farm exhibit was complete with everything from a milk cooler to a miniature poultry house containing an electric brooder and automatic water fountain, and featured such indispensables as an implement shed and a workshop containing, among other things, a band saw, an electric grinder and an arc welder. Summing it up, it was a case of Hydro bringing the farm to the city.

Another interesting and informative exhibit in the Hydro Building at the C.N.E. was the 60-cycle changeover exhibit where, by simply pushing buttons, visitors could get the answers to eight of the principal questions concerning Hydro's frequency standardization program. The pushing of a button below a given

question activated another lighted panel, providing the answer to each query. For the benefit of Hydro customers in the Toronto, Hamilton, Niagara Falls, Kitchener and Chatham areas, for example — where changeover operations were currently moving swiftly ahead — the "answer panels" listed the telephone number of the standardization office in each area, where prompt information on the program could be obtained. The "question-and-answer" panels also covered the warranties on converted equipment, changeover or exchange procedures for clocks and fans, appliances acquired or disposed of after inventory, arrangements made for those moving from a 25 to a 60-cycle area in Southern Ontario and other subjects.

Supplementing this main feature of the display was a large, lighted map showing the progress and the changeover schedule for the different 25-cycle areas as well as illustrated panels illustrating the story of "Operation Changeover" as it affects each type of customer: domestic, commercial and power.

The striking growth in the size of the changeover program over that originally estimated was an important theme of this exhibit. This was brought home to the visitor, for example, by figures showing that the

estimated number of 25-cycle domestic customers had risen from 697,400 to 880,000 — an increase of more than 25 percent.

### Toronto Hydro Display

Space in the Hydro Building was shared again this year with the Toronto Hydro-Electric System, whose display featured a "Parade of Appliances," all contained in a tunnel through which the visitor could pass and see appliances ranging from electric food mixers to frying pans and from paint removers to percolators. On the outside of the tunnel was a mural with illuminated wood cutouts of Toronto's major buildings, including the City Hall — complete with tower and clock indicating the correct time.

The mural also depicted how the power generated and transmitted to Canada's second largest city by Ontario Hydro is "stepped down" in Toronto Hydro substations for distribution to the offices, homes, businesses and industries of Toronto. The model also showed how Toronto Hydro substations blend with the architecture in a given commercial, residential or industrial area.

With these and other features of the display, Toronto Hydro gave a graphic picture of the past, present and future of the electrical age from the standpoint of municipal service.

—By Gordon Murphy



# A LOOK AT THE BLUE BOOK

Ontario Hydro's annual report is a major topic of discussion for Georgian Bay M.E.A. delegates during convention



SOME 200 DELEGATES ATTENDED THIS YEAR'S GEORGIAN BAY M.E.A. CONVENTION AT ORILLIA

**D**ISCUSSIONS ranging from Ontario Hydro's annual report to municipal ownership of substations featured this year's annual convention of the Georgian Bay Municipal Electric Association.

More than 200 delegates attended the sessions at Orillia on September 6 and 7, receiving an official welcome from Orillia's Mayor John R. MacIsaac. In his greetings to the delegates, President C. J. Halliday outlined the function of the association and the annual conventions. "The primary reason for our existence is to learn more about the great Hydro system," he said.

This year's meeting, with a wide variety of topics, provided this opportunity. Highlighting the sessions

was a spirited and enthusiastic panel discussion on the annual report of Ontario Hydro — often referred to as the "Blue Book," due to the color of its cover.

Ontario Hydro Vice-Chairman W. Ross Strike, acting as chairman of the panel group, which also consisted of W. M. Salter, Barrie; W. G. Lane, Collingwood, and G. F. Hutcheson, Huntsville, said that the main purpose of the discussion was to explain the contents of the report and to encourage municipal commissioners to make more extensive use of it. Through criticism and suggestions from the floor, improvements in the report could, quite possibly, be effected, he said.

Dealing with the expansion of

municipal systems, panel members stressed that publication of detailed information relating to construction of new facilities in each municipality serves a useful purpose. Discussing the section of the report relating to system operations, which was selected for special praise, Mr. Salter, one of the panelists, urged that commissioners familiarize themselves with the financial statements "as we are going to sink or swim with Hydro, and it is best to know as much about our assets as possible."

Widespread circulation of the report was revealed by the statement that requests for copies are received from all over the world, particularly from utility firms in the United States. Some 2,700 copies are print-



ed and sent to every municipal utility as required; to all members of the Ontario Legislature; to libraries and to a variety of interested organizations and associations. Commissioners' copies have usually been forwarded to them through their local utility offices, but delegates voted that copies of the reports, as well as copies of *Ontario Hydro News*, be sent to their private addresses in future.

### Consumer Service Division

In an interesting talk on the varied functions of Hydro's Consumer Service Division, I. K. Sitzler, Director, revealed the Division's method of estimating future load growth through consultation with manufacturers, who provide the Commission with data relating to the type and capacity of new equipment being placed on the market.

New light on Hydro techniques and procedures was provided during an informative question-and-answer period in detailed replies given by C. E. Crease, Consumer Service Engineer, Georgian Bay Region, Ontario Hydro; W. M. Salter, General Manager, Barrie P.U.C.; N. H. MacKinnon, Manager - Secretary,

Sudbury Hydro-Electric Commission, and B. M. Graham, Manager, North Bay Hydro Commission.

Lt.-Colonel A. A. Kennedy, O.M.E.A. President and Ontario Hydro Commissioner, commended the recent publication and distribution of the A.M.E.U. Guide to Municipal Standard Construction, stating that this volume is being well-received by the municipalities. Electrical suppliers and other municipalities in Canada and the United States are requesting copies. In this connection, the Ontario Hydro Commissioner pointed out that member municipalities are charged \$15 per copy while non-member organizations pay \$25 for each copy of the publication.

Reporting as a member of the Robert H. Saunders Memorial Fund Committee, Lt.-Col. Kennedy said that plans are being developed for a suitable memorial to the late Hydro Chairman to be erected in the grounds of the Canadian National Exhibition, Toronto, near the Ontario Government Building.

Delegates also heard a brief address by William Herod, President of the Electric Service League of

Ontario, which indicated increasing interest in the Red Seal campaign for adequate wiring. Mr. Herod

(Continued on Page 18)



△ WILLIAM HEROD, President of the Electric Service League of Ontario, urged support for the league's adequate wiring campaign.

MEMBERS of last year's executive, including: Front row, left to right: W. J. Cross, Hanover; C. J. Halliday, Chesley, President; H. G. Robertson, Barrie, and Robert Butter, Owen Sound, Secretary-Treasurer; back row, left to right: John M. Low, Uxbridge; Norman Kidnew, Walkerton; V. A. Ellis, Collingwood, and Harry Thiess, Orillia, were unanimously re-elected.

▽



A NOVEL and informative feature of this year's Georgian Bay M.E.A. Convention was a pole-top rescue demonstration presented by representatives of the Electrical Employers' Association of Ontario. Here delegates watch closely as Secretary-Treasurer Don Cameron (left foreground), describes the correct method of lowering a lineman to the ground.

▽





made an urgent appeal for the assistance and co-operation of all municipalities in this important project, climaxing his remarks with the presentation of a film, "The Magic Link," which demonstrated, humorously but effectively, the effects of inadequate electrical wiring.

### Safety Demonstration

Considerable interest was manifested in a demonstration staged by representatives of the Electrical Employers' Association of Ontario, indicating the correct procedure for applying artificial respiration to unconscious linemen while pole-top rescue work is in progress. Field supervisors Roy Beith, Bryn Jones and Harry Flack also showed the proper method of lowering injured linemen to the ground. Don Cameron, Secretary-Treasurer of the Association, stressed the importance of commencing immediate resuscitation, which exerts a vital influence on the injured lineman's chances of recovery. Delegates closely examined the recommended linemen's clothing and equipment, posing numerous questions regarding safety measures.

C. E. Forster, of the Bell Telephone Company, was another guest speaker during the convention. He described the functions of the company's micro-wave relay system in television transmission during his address on the subject "Your Telephone Company and Television."

Satisfaction with the present leadership of the association was indicated by the unanimous re-election of the 1954-1955 officers and directors to serve for another year, these being: Hon. President, H. G. Robertson, Barrie; President, C. J. Halliday, Chesley; 1st Vice-President, Lt.-Col. A. A. Kennedy, Owen Sound; 2nd Vice-President, Wm. J. Cross, Hanover; Secretary-Treasurer, Robert Butter, Owen Sound; Directors: John Low, Uxbridge; A. A. Wright, Erin; A. T. Smith, North Bay; Norman Kidnew, Walkerton; V. A. Ellis, Collingwood; L. A. Landreville, Sudbury, and Harry Thiess, Orillia. ■

THESE OFFICERS: Front row, left to right: H. Stanley Graham, Newcastle; E. V. Dyke, Smiths Falls; J. G. Baldwin, Lindsay, President, and Dr. R. A. Patterson, Kemptville; Back row, left to right: E. J. Bryant, Whitby; Frederick Hills, Peterborough; L. L. Coulter, Ottawa, and M. J. Elliott, Bowmanville, were elected to the E.O.M.E.A. executive for the next year.



## EASTERN ONTARIO MEETING

**E**QUALIZATION of Hydro rates was the major subject of discussion at this year's annual meeting of the Eastern Ontario Municipal Electric Association.

Held at Gil-Mar Lodge, Sturgeon Lake, near Lindsay, the sessions attracted a large group of delegates from Ontario points as far east as Ottawa.

In reply to a question from Renfrew Hydro-Electric Commission regarding the proposed equalization of rates, involving increases to some municipalities, Lt.-Col. A. A. Kennedy, President of the O.M.E.A. and Ontario Hydro Commissioner, replied that this matter had been under review for several years. This is the first move affecting 115-kv. transmission, he said.

"The O.M.E.A." he said, "is concerned with the whole of Ontario, and not merely with one or more sections. The O.M.E.A. is interest-

ed in securing equal interim rates for all Southern Ontario cooperating municipalities as a result of a resolution passed by the O.M.E.A. some five years ago. The water of this province belongs to all equally, so why should one municipality have to pay more than another."

President E. V. Dyke, of Smiths Falls, asked why rates in different municipalities are so varied—\$42 in one town, and perhaps as low as \$31 in another, although only 15 miles apart.

Lt.-Col. Kennedy said those responsible for the rates admit that there are inequalities, which cannot be remedied immediately. Smiths Falls rate has been low owing to its proximity to sources of power, eliminating the necessity of charging for high tension transmission facilities. It was impossible, the speaker pointed out, to equalize all rates immediately as this would have an adverse and possibly a disastrous





WILLIAM HOGG, Hydro's St. Lawrence Project Field Engineer (right), points out details of the large development to J. G. Wharry, Peterborough, and Mayor A. E. Hick, Lindsay (seated left to right), and W. H. Powell, Richard Raine, Peterborough, and J. G. Baldwin, Lindsay, shown standing left to right.



THIS group of panelists, left to right: L. L. Coulter, Ottawa; W. Ross Strike, Ontario Hydro Vice-Chairman; Frederick Hills, Peterborough, and M. J. Elliott, Bowmanville, conducted a discussion period on the function and the proper use of Ontario's Hydro's annual report.

effect upon the revenues of local commissions.

### Eliminate Discrepancies

To the query from Carleton Place P.U.C. concerning the basis of computation of the rates, W. Ross Strike, Ontario Hydro Vice-Chairman, replied that the methods used in "costing" power to the municipalities had been explained at most of the district conventions two years ago by K. C. Coleman (Ontario Hydro's Director of Accounting), adding that every effort is being made to eliminate admitted discrepancies in the rates.

Ontario Hydro's annual report (the Hydro "Blue Book") was discussed with M. J. Elliott, Bowmanville, Fred Hills, Peterborough, and L. L. Coulter, Ottawa, forming the panel group under the chairmanship of Mr. Strike.

Outlining the reasons for its publication, Mr. Strike said the object of initiating these panel discussions was to encourage greater use of the report by local commissioners, as it contained information of great value to them. Discussion of the report was designed also to secure suggestions for its improvement.

The panel examined the volume, section by section, and suggested

that publication of information concerning street lighting, rates and conditions, types and sizes of lights, be resumed as this information is considered very helpful. The panelists noted that there is uniformity of rural rates, and agreed that section 8, dealing with municipal electrical services, is very important and should certainly be continued. It was also felt that amendments to the Public Utilities Act should be published, but it was suggested that this information could be provided in the form of a separate pamphlet.

Delegates voted that they preferred to have the annual report and other Hydro publications sent to their homes, rather than to the local utility offices.

### Welcome New Member

A note of optimism was injected by retiring President E. V. Dyke in his address of welcome when he announced that Hawkesbury Hydro-Electric Committee had joined the association. Mr. Dyke reported that only five eligible Eastern Ontario municipalities had not taken out membership to date.

Turning to a subject of particular interest to the representatives of Eastern Ontario communities, Mr. Dyke urged delegates to visit the St. Lawrence Power Project.

As a substitute for a personal visit to the important development, William H. Hogg, Field Project Engineer, provided an illuminating address, supplemented by photographs and maps of the St. Lawrence Project.

A demonstration of a pole-top rescue staged by the Electrical Employers' Association of Ontario, and an address on the theme of the value of water by J. G. Wharry, Quaker Oats Company, were other interesting and informative subjects helping to make this a well-balanced and instructive convention.

Officers and directors elected to serve during the coming year were: J. G. Baldwin, Lindsay, President; E. V. Dyke, Smiths Falls, Past President; Dr. R. A. Patterson, Kemptville and Stanley Graham, New-castle, Vice-Presidents; Col. James Harris, Kingston; George Findlay, Carleton Place; L. L. Coulter, Ottawa; Fred Hills, Peterborough; M. J. Elliott, Bowmanville, and E. J. Bryant, Whitby, Directors.

Preceding the general meeting, delegates stood in silence for two minutes in memory of the late Robert H. Saunders.

Ottawa, by unanimous consent, is to be the venue for the 1956 convention. —By Frank C. Wood.

# ON TO WHITEDOG



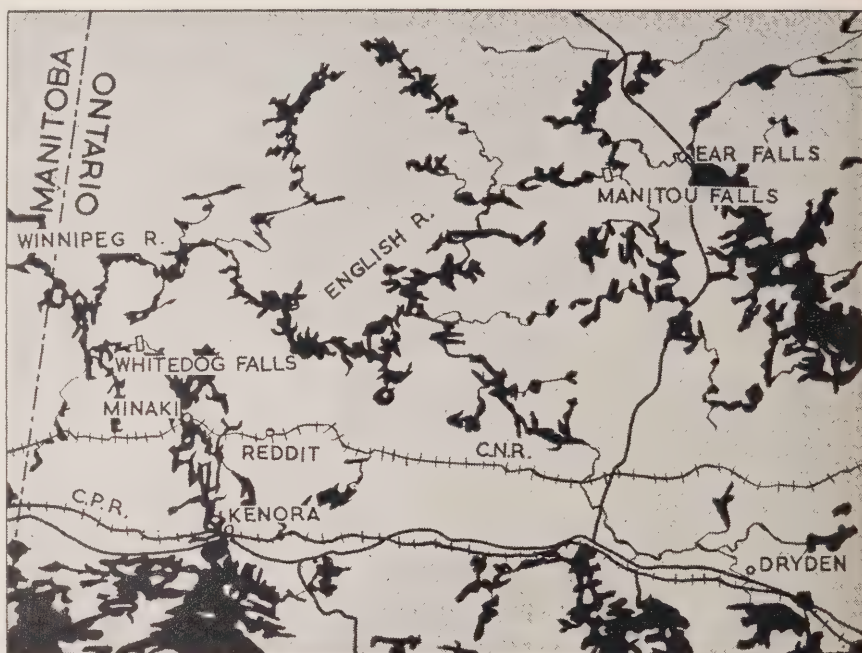
*Once an avenue of travel for early Canadian explorers and fur traders,*

*the Winnipeg River has been chosen as the site of Ontario Hydro's newest power project*

**P**ARTNER in fame with such early Canadian explorers as Radisson and the chivalrous Sieur de La Vérendrye, the historic and tumbling Winnipeg River is destined for an even more significant role in the story of Ontario's growth.

Within a few months, Commission construction forces will converge on a site, 15 miles north of Minaki in the District of Kenora, and before the year 1957 has run its course, engineering ingenuity will have harnessed the energy of this turbulent stream at Hydro's new Whitedog Falls Generating Station. Representing the seventeenth new power source inaugurated by Hydro since 1945, this latest development is designed primarily to augment the power resources of northwestern Ontario. With an installed capacity tentatively set at 71,700 horsepower (53,500 kilowatts), the plant will have a major role in meeting the soaring power requirements imposed by rapid expansion of the mining and also the pulp and paper industries of this section of Ontario.

Hydro's record-breaking construction program in the past decade has increased the hydro-electric capacity of the Commission's Northwestern Division by 260,500 horsepower (194,300 kilowatts), including the building of the Aguasabon (Aguasabon River) and Pine Portage (Nipigon River) Generating Stations and a one-unit addition to its



FIFTH new power source undertaken by Hydro in Northwestern Ontario since 1945, the site of the Whitedog Falls development is situated approximately 30 miles northwest of Kenora.

Ear Falls plant on the English River. At the present time also, construction forces are pushing ahead rapidly with the Manitou Falls Generating Station, another English River development, which will have a dependable peak capacity of 75,300 horsepower (56,200 kilowatts) in four units on completion late in 1956. Provision has been made in the design of this station for the addition of a fifth unit when necessary.

The Whitedog Falls project, which will have an estimated total cost of approximately \$20,000,000, including transmission facilities, will be located at the downstream limit of Whitedog Falls. The development will feature a main dam and a powerhouse operating at a rated head of 50 feet. Scheduled for initial operation late in 1957 and for completion early in 1958, the new plant will be incorporated into the Commission's Northwestern



Division (Northern Ontario Properties) system by the building of a 115,000 - volt, double - circuit steel tower transmission line, approximately 30 miles long. One circuit will be strung from the generating station to a new transformer station being established near the Town of Kenora.

### 17-Mile Access Road

Present plans call for the commencement of actual construction at the site early in 1956, in order to meet the "in-service" dates for the plant's individual generating units. A necessary preliminary to this phase of the project will, however, be the clearing and building of a 17-mile access road between Minaki, the nearest rail point, and Whitedog Falls. This work is now underway.

Harnessing this fast-moving river in the rugged depths of the Kenora forest is a logical destiny for the Winnipeg, which is believed to have derived its name from the Cree Indian title, "Winipi" or "Winnepe," meaning "turbid." The dictionary defines "turbid" figuratively as unsettled or confused.

### First White Man

Jean Baptiste de La Vérendrye, eldest son of Sieur de La Vérendrye, who is regarded as the discoverer of the "Great Northwest"

(now western Canada), is said to have been the first white man to explore the river about 1733. Around this time, young de La Vérendrye established Fort Maurepas at the mouth of the river.

Geographically speaking, the river drains Lake - of - the - Woods and flows in a northwesterly direction into the southeast arm of Lake Winnipeg. To the head of its ultimate source, the Firesteel River, not far from the western shore of Lake Superior, the Winnipeg is 475 miles long. Its principal tributary is the English River, which enters from the east, near the Ontario-Manitoba boundary, after a course of 330 miles.

Draining an area of some 44,000 square miles, and dropping over rapids, falls and cascades for a distance of 160 miles, it seems natural that the Winnipeg should become a source of power for the province.

Although the early explorers could not possibly have predicted such a function, the rapid waters of the Winnipeg evoked many awe-inspired comments in the narratives of their journeys along its tortuous length.

One of the earliest descriptions of a trip down the Winnipeg appears in a book by Alexander Henry

the Elder, *"Travels and Adventures in Canada and the Indian Territories between 1760 and 1776."* The author called the river "Winipegon" and describes his journey as follows: "From the Portage du Rat (site of the present Town of Kenora) we descended the great river Winipegon, which is there from one mile or two in breadth, and at every league (a British nautical league is equivalent to three miles) grows broader. The channel is deep, but obstructed by many islands, of which some are large. For several miles, the stream is confined between perpendicular rocks. The current is strong and the navigation singularly difficult. Within the space of fifteen leagues, there are seven falls of from 50 feet to 100 in height."

### Power Development

One of the first references to the feasibility of power development by Ontario on the Winnipeg River appears in a booklet, "Water Powers in Canada," published in 1915 and prepared by H. G. Acres, the Commission's Hydraulic Engineer at that time. Mentioning the possibility of developing power at Whitedog Falls, Mr. Acres stated: "The two principal sources of power for the district are the Winnipeg and English Rivers. In addition to a large

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AERIAL view of two arms of the Winnipeg River near the site of Hydro's latest project, which is scheduled for initial operation in 1957.



HYDRO construction forces are building a 17-mile access road from Minaki — the nearest rail point — to the site.







TRIPOD on the opposite bank of the river indicates that drilling operations, to determine foundation conditions, are in progress.



ENGINEERS' camp was established on Whitedog Island during the past summer while preliminary surveys of the river were carried out.

natural minimum flow, the hydraulic value of these rivers lies in the fact that the extensive lake areas in their basins provide facilities for practically doubling the water flow."

Actual development of the hydro-electric resources of the river, within the boundaries of Ontario, moved a step closer early in 1950 with the joint formation of a body known as the Winnipeg River Inter-provincial Board by the Governments

of Ontario and Manitoba. Comprising representatives of both provinces, including Dr. Otto Holden, now the Commission's Chief Engineer, and E. M. Wood, at that time an Ontario Hydro consulting engineer on system planning, the board was invested with the responsibility of conducting investigations and developing plans for the maximum economic development of the Winnipeg River watershed to the mutual advantage of both provinces.

And so the Winnipeg, once the main artery of travel for the adventurous explorers and fur traders of the 18th century, has moved forward gradually toward its ultimate goal as a great power-producing stream. Already its potential power has been "yoked" by the people of Manitoba at seven sites, and the day is not far distant when it will make a profound contribution to the progress and development of Ontario. ■

## FOR TODAY AND TOMORROW

*(Continued from Page 8)*

When the St. Lawrence Power Project is placed in service in 1958, it will serve this grid.

### Large Grid

"This means that Brockville, in common with hundreds of other municipal utilities, will have as the backbone of its system one of the largest electrical grids on this continent."

Ending his address on this optimistic note, Mr. Strike declared the building open as he handed a pair of scissors to the Hon. H. A. Stewart. Mr. Stewart, a one-time Canadian

Minister of Public Works, who served on the Brockville Commission in 1905 and 1906 in his capacity as mayor, smilingly cut the ribbon across the entrance amid the applause of the audience.

Brief congratulatory addresses were given by H. A. Howard, President, A.M.E.U.; Lt.-Col. A. A. Kennedy, President, O.M.E.A., and Ontario Hydro Commissioner; E. V. Dyke, President, Eastern Ontario Municipal Electric Association; Hayden Stanton, M.P., Leeds; James Auld, M.L.A., Leeds, and O. S. Luney, Manager, Eastern Region, Ontario Hydro.

Following a comprehensive review of the Brockville utility's history by

Commissioner F. C. Curry, the new building was formally dedicated by the Rev. Morgan E. Rowland, President, Brockville Ministerial Association. During the civic banquet, which preceded the opening ceremonies, Commissioner J. R. Philips introduced the guests. A vote of thanks to those participating in the event was extended by Commissioner W. W. Ashworth.

Accepting the keys from the architect, Chairman Walter invited the audience to inspect the new building where he headed a reception committee, which included: Commissioners Curry, Philips, and Ashworth as well as Manager H. W. Little. ■



# GRANNY'S APPLE

Ontario's famed "McIntosh Red," which had its origin in the historic St. Lawrence Valley, enjoys a close association with the story of the province's development

By ALLAN A. JONES



It's ONLY a small, tranquil village called Dundela, situated a few miles north of the Village of Iroquois, an important St. Lawrence Valley community now being relocated by Ontario Hydro as part of the seaway and power project.

Like many other Ontario hamlets, though, Dundela's historical significance is ample compensation for its modest size, since in one unique and important way, Dundela has close associations with the history and development, not only of the St. Lawrence area, but with the rest of Ontario and beyond. What began here more than a century ago has played a colorful part in the story of Ontario's progress, to which Hydro itself is now adding another new and fascinating chapter along the mighty river.

The beginning seemed insignificant enough. Discovery of nothing more than an apple—even the "McIntosh Red" apple—seems comparatively unimportant when compared with Hydro's present monumental project of building a huge generating station with which to provide vitally-needed electricity

for a steadily expanding and power-hungry province. Yet, out of the chance seedling, which produced the first McIntosh "Red" tree at Dundela, there emerged a specialized McIntosh apple industry, which, today, accounts for about a third of all the apples grown and marketed in Canada.

"McIntosh" is now a household word in most Canadian and many American homes, conjuring up visions of a bright, red fruit with a succulent, snow-white centre. It is grown in countless orchards in the valley of the St. Lawrence and in other parts of Ontario, in Quebec, British Columbia, New Brunswick, and in lesser quantities in other Canadian provinces, as well as in many parts of the United States. It is the backbone of the apple industry and has been used as the parent, perhaps more than any other variety, in the development of several new species, such as the Melba and Milton.

Fruit growers have rushed to join the McIntosh production line—to such an extent, in fact, that one recent estimate puts the annual North American crop at from fif-

teen to eighteen million bushels with a total cash value of from thirty to thirty-five million dollars. In Ontario, the proof of the apple's popularity was provided by a 1949 survey, which revealed that 274,332 McIntosh trees were growing in the province, or just short of one third the total number of apple trees of all other types.

## Throw of the Dice

Chance doesn't always yield such spectacular—and profitable—results. Yet it was largely chance—plus a margin of native prudence—that prompted young Scottish immigrant John McIntosh to transplant 20 wild apple seedlings on his pioneer farm at Dundela about the year 1811, when what is now known as the City of Toronto was little more than a clearing in the woods known as "muddy York." It was one of these seedlings, which survived to bear the first crop of the now-famous apples.

How the seedlings came to be there in the first place seems to be something of a mystery, but a number of guesses have been made. One

*(Continued on Page 24)*





△  
SON of the discoverer of the McIntosh apple tree, Allen McIntosh, who is credited with propagating and perpetuating the famous apple, is shown beside the original tree at Dundela, Ont., which was almost 100 years old when it yielded its last fruit.

THIS monument to John McIntosh stands in ▷  
St. John's Cemetery, east of Iroquois Village.



is that they were planted or scattered by French settlers, who moved into the St. Lawrence area after the British conquest of Quebec.

Whatever the origin, when John McIntosh had tasted the fruit of the surviving tree he knew he had, not just a good, but a superlative thing. His wife, Hannah, was evidently even more aware of it, because it was she, more than John, who tended and nursed the "astounding Red." It was through her, in fact, that the fruit first became known as "Granny's apple," a title bestowed by her grandchildren.

The name by which it is now known was apparently the inspiration of John McIntosh's son, Allen, who is also given the credit for having perpetuated the tree through budding and grafting. Allen is said to have learned the technique from an itinerant farmhand, who visited the farm one day and was so impressed by the taste of the apple that he stayed to help with its propagation.

Despite the enthusiasm of its discoverers, however, it was not until about the turn of the century that the McIntosh began to make its presence felt throughout the country. The apple would have died slowly of neglect, in fact, if others had followed the advice of some commercial growers, who, late in the 19th century, argued that it was not worth producing.

Fortunately for present generations, almost everyone else was optimistic, including Dr. W. T. Macoun, Dominion Horticulturist in 1900, who prophetically observed at that time:

"I think the McIntosh is going to be one of our leading dessert apples."

#### Damaged By Fire

It was only about eight years after Dr. Macoun's report that the original tree at Dundela, now close to a century old, finally yielded the last of its fruit and succumbed to





▽ GRANITE stone, erected by Dundas County in 1912, marks the site of the original tree. The property is now owned by S. A. McIntosh, a great grandson of the discoverer.

the ravages of time. Its death was hastened by fire, which had partly crippled the tree when the nearby homestead, built by John McIntosh and his son, Allen, burned to the ground in 1893.

Today, anyone passing through Dundela can see the monument, which the grateful people of Dundas County—aided by a grant from the Ontario Fruit Grower's Association—erected in 1912 to perpetuate the memory of the original McIntosh apple tree. This is only one of several monuments in the area, which now keep alive the legend of the fabulous apple.

There is a monument to John McIntosh, for example, at St. John's Cemetery, east of Iroquois, and another to his son, Allen, at the McIntosh family cemetery in Dundela. About one mile north of Dundela stands a cairn honoring Hannah McIntosh, John's wife, and last but not least, a granite stone marks the spot where the original tree grew in Dundela.

Another memorial, perhaps equal to or even better than any form of stone is the gathering of the McIntosh clan, which now takes place every year at Doran's Point, about a mile east of Iroquois. Since 1939, descendants and "in-laws" of John McIntosh have gathered an-

nually at the Point to enjoy a basket picnic, and to lend an appreciative ear, which often only a Scot can give, to the wailing skirl of the bagpipes.

#### Clan Chief Present

In August of this year, Doran's Point was once again host to the clansmen, and boasted the presence of none other than the McIntosh Clan Chief, Vice-Admiral Lacklan Donald Mackintosh, CB, DSO, DSC, of Moy Hall, Inverness-shire, Scotland.

Among the clansmen, too, were, two great-grandsons of John McIntosh, both of whom still live in the St. Lawrence area where the "Red" was discovered. One of them is S. A. McIntosh, who lives at Dundela on the site of the original McIntosh farm, and has a thriving "Red" orchard. The monument to the tree stands on his front lawn, but otherwise there is no other sign that it was here the world-famed apple was born.

The other great-grandson is Dr. Pember A. McIntosh, a venerable but still busy "country doctor" at Spencerville, near Dundela, who is largely responsible for the erection of the monuments to his famous forebears, John and his wife Hannah, and is the guiding spirit behind the annual gathering of the clan.

DR. Pember A. McIntosh, another great grandson, is a busy medical doctor at Spencerville near Dundela. Dr. McIntosh, who takes a keen interest in the history of the St. Lawrence area, displays a prized possession—a piece of the original tree



Dr. McIntosh has a great interest in the general history of eastern Ontario, and of the McIntosh apple and family in particular, and among the mass of historical data he has accumulated over the years is the following somewhat whimsical account of the origin of the name "McIntosh":

"The name McIntosh, spelled in various ways, originated in 1163 when Shaw McDuff, nephew of King Malcolm IV of Scotland, received appointment as GOVERNOR of the rebellious tribes of the Moray district of Scotland. He, being the leader, was designated TOISICH, a Celtic (Gaelic) term meaning leader or chief, and his followers became MHIC-AN-TOISICH, or sons of TOISICH."

And so, by a long and mysterious process, MHIC-AN-TOISICH became McIntosh. It was lucky for the famous "Red" apple, at any rate, that it did. Anybody like a MHIC-AN-TOISICH? ■

## ALONG HYDRO LINES



### Report Reveals Lighting Progress

Outstanding progress in renovating the city's street lighting system was revealed in the 44th annual report of the Toronto Hydro-Electric System.

Presented by Chairman Bertram Merson, Mayor Nathan Phillips, Vice-Chairman John McMechan, General Manager H. J. MacTavish and Assistant General Manager J. S. McGregor, the report shows that during 1954, 6,915 street lighting units were installed, including 6,472 residential luminaires, 27 fluorescent units on Front St., 140 facade units on Yonge St., and 276 luminaires on main traffic thoroughfares and bridges.

The number of luminaires installed and in service in Toronto and Leaside by the end of 1954 totalled 22,550 units, covering a distance of approximately 515 miles. By the end of April, 1955, the city had reflector refractor luminaires on practically all traffic and residential streets.

## Ninth City Standardized

**GUELPH** has become the ninth city in the Southern Ontario 25-cycle system to be standardized by Ontario Hydro for 60-cycle operation, following the last switch to the higher frequency in the Huskisson-Ontario Street district. Other former 25-cycle cities now operating at 60 cycles are Sarnia, Windsor, London, Stratford, Waterloo, Kitchener, Galt and Niagara Falls.

The general changeover program in Guelph, begun last April 5, involved some 8,800 domestic and commercial customers served by the Guelph Board of Light and Heat Commissioners. Completion of the general program in Guelph, in less than five months, was made possible by the fact that many industries in the municipality had received 60-cycle power under Ontario Hydro's advance standardization program. Where economies could be effected, a special program was instituted to check load growth at 25 cycles by providing the higher frequency for new industries making plant expansions, and for new housing developments.

### Veteran Commissioner Ends Railroad Career

A man who was a member of Schreiber's first hydro-electric commission, and who has been a member of the commission ever since, J. D. Phillips, recently retired from a railroading career after 43 years with a clear record. Mr. Phillips was Reeve of Schreiber when Ontario Hydro took over service to the community and as such occupied a seat on the original commission.

Mr. Phillips, a native of Arnstein, Ontario, went to Schreiber in 1912 and joined the C.P.R. as a fireman. In 1918, he became an engineer and spent 18 years in that capacity, eight of them in the passenger service. His interest in public service began in his home town, while he



J. D. PHILLIPS

served on Schreiber Municipal Council for three years, the local board of health for two years, and as a Reeve for two years. Active in O.M.E.A. circles, Mr. Phillips is a Past President of District 3 and a former District Vice-President of the parent organization.

A happy coincidence was the fact that his son, Burton, was his fireman on his last trip as a C.P.R. engineer; added to this was the presence of other members of his family and many old friends at the end of the trip to offer congratulations.

## Classified Ads

### FOR SALE

2 — C.G.E. Series Transformers for street lighting. 10kw Form kr Type St.: EN-41898 Primary amps. 6.6; Secondary amps. 20. Secondary Volts 500. Year of Manufacture — 1927. Serial Nos. 117690, 117691. Price now—approximately \$700.00 each. Please apply to: Mr. W. D. Stalker, Manager, Simcoe P.U.C., 45 Sydenham St., Simcoe, Ontario.

In Canada in 1939 there were 13 agricultural workers for every seven employed in manufacturing; today there are 13 manufacturing workers for every eight employed in agriculture.

—Quick Canadian Facts





△  
HYDRO Chairman Dr. Richard L. Hearn, left, presents a volume of tributes to Dr. Dobson.

## Distinguished Engineer Honored

LIMAXING a career of significant accomplishment in the field of science, Dr. William Percy Dobson, Research Consultant, Ontario Hydro, and formerly the Commission's Director of Research for many years, was honored at a recent complimentary dinner by a host of Hydro colleagues and other associates in the engineering world on the eve of his retirement. Dr. Richard L. Hearn, Ontario Hydro Chairman, presented Dr. Dobson with a bound volume of tributes from a wide circle of fellow-scientists and engineers emphasizing Dr. Dobson's brilliant and unique contribution to Canada's technological progress. Dr. and Mrs. Dobson were also presented with a television set by members of the Commission staff.

A native of Ballinafad, Ontario, Dr. Dobson graduated from Harriston High School and the University of Toronto in 1911 when he obtained his B.A.Sc. He was awarded a research fellowship by the Engineering Alumni and returned to the university where he obtained his Master's

degree in science at the 1914 convocation. In 1951, Queen's University conferred the honorary degree of Doctor of Science on him. Dr. Dobson joined the Commission in 1914 as testing engineer in the laboratory, succeeding H. G. D. Crear (now General), who was Commander-in-Chief of the Canadian Army Overseas during World War II. In addition to publishing technical papers in many engineering and technical journals, the distinguished Hydro engineer served on some 35 committees of several societies and other associations, including the National Research Council of Canada, American Institute of Electrical Engineers, International Electro-technical Commission and the American Standards Association.

Closely associated with standards work in Canada, he has taken a pre-eminent role in the activities of the Canadian Standards Association. He was a member of the special committee, which investigated the need for the Canadian Electric

Code. He was also a member of the executive committee until 1950 and held the chairmanship of the Approvals Division from 1940 to 1950, in addition to serving as a member of numerous other committees. Dr. Dobson was President of the Association of Professional Engineers of Ontario in 1939 and held the Presidency of the Dominion Council of Engineers from 1942 to 1945. He was President of the Canadian Association of Physicists in 1948.

While serving as Chief Testing Engineer with the Commission, Dr. Dobson made an outstanding reputation for himself as a research engineer, culminating in his appointment as Hydro's Director of Research in 1948. In 1953 he relinquished this position to become Research Consultant to the Commission and Hydro's Liaison Officer with Atomic Energy of Canada Ltd. ■

### Hydro and C.N.R. Link Manitouwadge

Power from Ontario Hydro and a recently-opened C.N.R. line, 24 miles long, connecting with the main transcontinental line northwest of Sudbury, will give northern Ontario's new base metal developments the necessary boost to put a 3,300-ton-a-day milling plant into operation. When production gets underway, it is expected that from 15 to 20 carloads of copper, zinc and pyrite concentrates will be shipped out of the area daily.

Ontario Hydro's new 115,000-volt transmission line (see *Ontario Hydro News—May, 1955*) from Terrace Bay Substation to Geco Mine, a distance of approximately 73 miles, was ready for service on July 29 this year. Branch lines tap the line to supply power to substations at Marathon, an important pulp and paper townsite on Lake Superior, and at Manitouwadge townsite—a model community connected with the Geco Mine, expected to have an eventual population of more than 3,000. Another branch line serves Wilroy Mine substation.



R. M. LAURIE

WORD has been received by R. M. Laurie, Manager, Western Region, Ontario Hydro, that he has been named a Fellow of the American Institute of Electrical Engineers. The citation accompanying the announcement said that Mr. Laurie had been given the honor "for development of interconnected pool operation of large electric power systems on an international scale."

## FRED B. PENSE

Chairman of the Public Utilities Commission of the City of Kingston and a member of a well-known Kingston family, Fred B. Pense died recently in Kingston General Hospital after a lengthy illness.

Born in Kingston in 1890, he was educated in that city, and for several years was engaged in the newspaper business both as a reporter and editor. His uncle, the late E. J. B. Pense, first President of the Canadian Press, was the publisher of the *British Whig*, which was later merged with another paper to form the *Kingston Whig-Standard*. Noted for his strong sense of civic duty, Mr. Pense was a member of the Kingston Board of Education for 10 years, being named Chairman on three occasions. He served as President of the Ontario Urban and Rural Trustees' Association in 1950 as well as on several committees and other groups affili-

ated with this association. Equally prominent in church work, he was also a Past President of the Kingston Rotary Club, serving on several club committees as well as being an active member of the Canadian National Institute for the Blind, Kingston Horticultural Society, the Frontenac County Fair Board and the Y.M.C.A.

He was elected to the local commission in 1952 and 1954 and was serving as Chairman at the time of his death. He is survived by his wife and two brothers. ■

## Monster Transformers for Leaside T.S.

Believed to be the largest ever built or installed in Canada, two power transformers have been ordered by Ontario Hydro from the English Electric Co. of Canada. The units are scheduled for installation in the Leaside Transformer Station near Toronto.

The transformers, each weighing 300 tons, are being built at English Electric's St. Catharines plant, and are expected to be completed in May or June of next year. Both are 215,000 kva, 3 phase, 60-cycle, oil immersed auto transformers, the equivalent of two winding transformers of 148,000 kva.

# Shand Dam Changeover

EQUIPMENT associated with the operation of the Grand River Conservation Commission's Shand Dam, near Fergus, has been changed over to 60-cycle frequency. The dam was kept in operation during standardization by removing, two at a time, the 35-horsepower motors, which raise and lower the four sluice gates controlling the waters of Lake Belwood, created by the dam. These motors were then re-wound for 60-cycle operation, and replaced in readiness to go into operation when the frequency supplying the dam was switched to 60-cycle power on September 19.

The sluice gates' control platform is some 30 feet above the railroad which crosses the dam. The heavy motors were lowered and raised from the platform by means of a mobile crane, which moved into position on the narrow roadway beside the railway tracks. Other equipment changed over at the Shand Dam included the emergency generator, transformers, motorized valves, water and sump pumps. This operation was regarded as a vital changeover assignment because of the Shand Dam's importance in connection with conservation and flood control on the Grand River.

## Ontario's Domestic Power Costs Down

Figures released recently by the Dominion Bureau of Statistics show that while the average cost of electricity for household use increased slightly for Canadians during the past year, the Ontario index at the end of 1954 (based on 1935-39 costs) dropped from 100.84 to 100.81, the only decrease recorded in any province in Canada. The Bureau also reports that domestic customers in Macleod, Alberta, used the smallest amount of electricity—an average of 64 kilowatthours a month for each domestic customer. The highest was the average of 668 kilowatthours a month in Fort William. The minimum net monthly bills ranged from 44 cents per domestic customer in Moose Jaw, Saskatchewan, to \$2 in Charlottetown, P.E.I.

## New Line Serves Three Communities

Greater dependability of Ontario Hydro service to the communities of Elmira, Elora and Fergus will result from the completion of a new 60-cycle power transmission line. This 27,600-volt line extends from the Elmira Municipal Station via Hydro's new Floradale Distribution Station (two miles north of Elmira) to Elora, and thence to Fergus.



(Continued from Page 11)

### The Long, Long Trail

It was an imposing cavalcade that left the Scout's tent city each day during the Niagara tours. The fleet of 70 buses, provided by the Jamboree for the occasion, carrying the daily quota of close to 3,000 Scouts, stretched for almost six miles along the highway in the first leg of the trip from the Jamboree site to the monument to Sir Isaac Brock at Queenston Heights. Some 30 police officers, including Hydro's security officers, were detailed either with the buses, or along the tour route to clear the way and to control parking. Helping guide the tours were Hydro's Niagara Project Information Officer Lloyd Young and Project Chief Guide Paul Clement, both of whom worked with Jamboree officials in the planning and co-ordination of the special sightseeing trips.

The Scouts made up what was undoubtedly the biggest single group of visitors ever to tour the Niagara area, with its major Hydro developments, and the fact that the trips went without a "hitch" is a tribute to the preparation that preceded them. The entire Jamboree, in fact, was an outstanding triumph of organization.

### Hydro Talks

Before they set out on the tours, the Scouts were given a special briefing by Ontario Hydro Information Officer R. J. Cooksley. Addressing them in the Jamboree Arena on each of three nights before the tours got underway, Mr. Cooksley spoke principally on the Hydro projects in the Niagara area, but also touched on points of historic interest such as the Brock monument at Queenston. He used colored slides projected on a twelve-foot screen as illustrations.

An interpreter did a simultaneous translation of the talks into French, so that, despite the great variety of nations represented, most of the

## Hydro's Settlement At Iroquois Commendable

(From the Ottawa Citizen)

A new formula has been devised for compensating residents of the Iroquois area who will be displaced by the St. Lawrence hydro-electric project, and it appears that it will give satisfactory, if rough, equity to the citizens concerned. Ontario Hydro, which worked out the proposal, has shown commendable flexibility in its approach. With work on the St. Lawrence project going ahead at a good pace, a settlement must be made soon. The tentative endorsement given the proposal by Reeve Lloyd Davis, of Iroquois, indicates that actual removal may now continue in full stride.

Instead of the normal formula, which requires payment of the value of the expropriated property plus a bonus of 10 percent, Ontario Hydro is offering the value of the property plus 15 percent for inconvenience caused. In addition, the owner will be sold a lot. This is an important point, for it recognizes the principle that replacement value should be given greater weight than market value in an appropriation of this kind. It is poor compensation to give a householder \$1,000 as the market value of his lot when circumstances are such that he cannot replace it for less than \$2,000.

As well, Hydro will move existing houses to fully-serviced lots where this is feasible. New heating equipment will be installed in such cases, basements provided and other necessary improvements made. In brief, Hydro is trying to ensure that a man dispossessed because of the power project will have the means to obtain equivalent accommodation nearby. Since the project will benefit all Hydro customers, it is only proper that any sacrifice to be borne should be shared by all and that undue burdens should not be placed on householders who will be flooded out by the scheme. A settlement satisfactory to the residents of Iroquois should, therefore, bring satisfaction to everyone.

Scouts were able to understand and appreciate the information that was given them. On one evening, there were close to 5,000 visitors in the arena as well as the Scouts themselves.

That the youthful Jamboree visitors had become Hydro-conscious by the end of each day's tour was evidenced by the number who visited the Commission's Remedial Information office near the Falls. About 75 percent of them went through the office and the presence of the Scouts swelled the number of tourists as well, so that for the four

days the office was host to about 3,000 visitors a day, four or five times the average.

Quite a few Scouts, too, returned on their own to the reception centre of the Sir Adam Beck-Niagara G.S. No. 2, at Queenston, eager to make a more complete inspection of the giant development. All in all, the stories that they tell their friends "back home" in some 68 countries are more than likely to include references to Ontario Hydro, as well as the magnificent Falls, which are the mecca for sightseers from all parts of the globe. ■

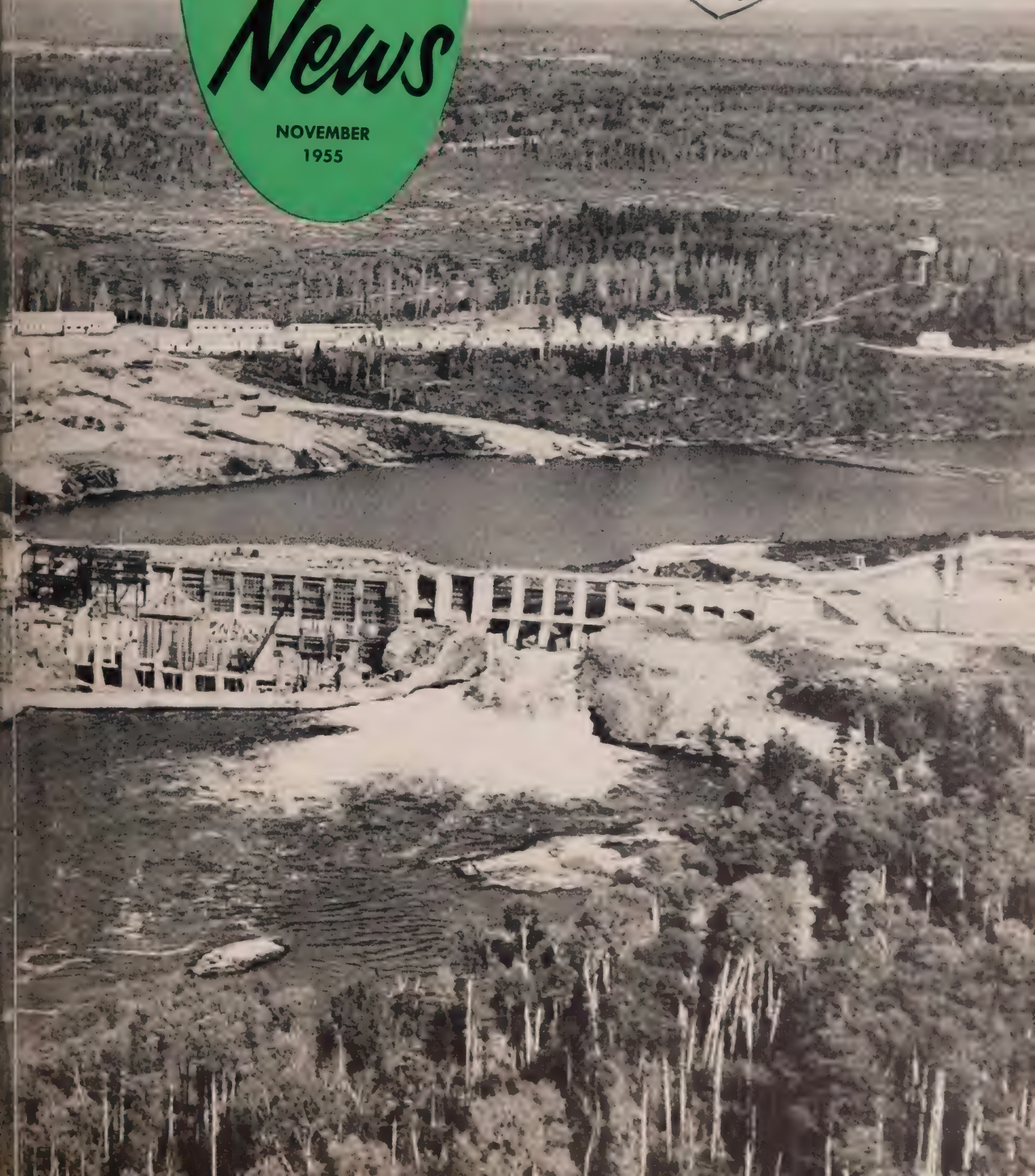




*Behold congenial Autumn comes,  
The Sabbath of the year!*

— JOHN LOGAN, *Ode written on a  
Visit to the Country in Autumn.*









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## REALISTIC AND SOUND

**S**PEAKING at a recent meeting of The Royal Canadian Institute in Toronto, Dr. Richard L. Hearn, Ontario Hydro Chairman, captured the attention of his audience with his vivid portrayal of the future role of nuclear energy in the development of electric power, both in Ontario and in other sections of Canada.

The speaker brought the importance of this subject into sharp focus by pointing out that Canada must be prepared to meet demands of some 34 million kilowatts (45.6 million horsepower) by 1975. With approximately 13 million kw. (17.4 million hp.), being developed at the beginning of the present year, Canadian utilities must be prepared to develop an additional 21 million kw. (28.2 million hp.) in the next 20 years.

Dealing specifically with Ontario, Dr. Hearn cited the Commission's estimate that power demands by 1975 will have increased to about 9.5 million kw. (12.7 million hp.) in Southern Ontario. By 1960 approximately 4.6 million kw. (6.2 million hp.) will be available, leaving some 5 million kw. (6.7 million hp.) of additional generation to be provided between 1960 and 1975. The Hydro Chairman noted, however, that all the major hydro-electric sites in Southern Ontario will have been developed with the completion of the St. Lawrence Power Project in 1960.

Although Canada has potential hydraulic resources presently estimated at 49.2 million kw. (66 million hp.), the majority of the undeveloped water-power sites are in less accessible locations. Therefore, unless it becomes economically feasible in the next few years, to develop and transmit large blocks of power over long distances, Ontario and the Prairie and Maritime provinces must consider providing power from thermal stations, using either coal, gas, oil or nuclear reactors to produce steam for the turbo-generators.

Dr. Hearn's address included a full description of Canada's program for the development of economical nuclear-electric power in which Ontario Hydro is participating jointly with Atomic Energy of Canada Ltd. and the Canadian General Electric Company.

Setting forth the objectives of the 20,000-kilowatt nuclear power demonstration station at Des Joachims, which will feed its output into the Commission's Southern Ontario System (see *Ontario Hydro News* — September, 1955), Dr. Hearn described the present approach to the development of an economic nuclear power plant in Canada as both "realistic and sound."

In this connection, he expressed the conviction that "power generated from nuclear sources at considerably reduced cost is probably less than a decade away and I am proud to say that Canada will have shared in the achievement of this aim."

Voicing agreement with the opinion of other Canadian scientists and economists that nuclear electric plants will have only modest roles in the years immediately ahead, Dr. Hearn, however, made the significant prediction that nuclear power plants may conceivably account for approximately 10 to 15 percent of the total generating capacity in Canada by 1980.



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## COVER PHOTO

Despite the seemingly insurmountable obstacles of great distances and difficult terrain, Ontario Hydro engineers and construction men are winning a battle with Nature at the site of Ontario Hydro's Manitou Falls project on the English River. The full cover photograph this month depicts the sprawling camp and the main dam and powerhouse on which work is proceeding some three months ahead of schedule — see Page 2 in this issue.

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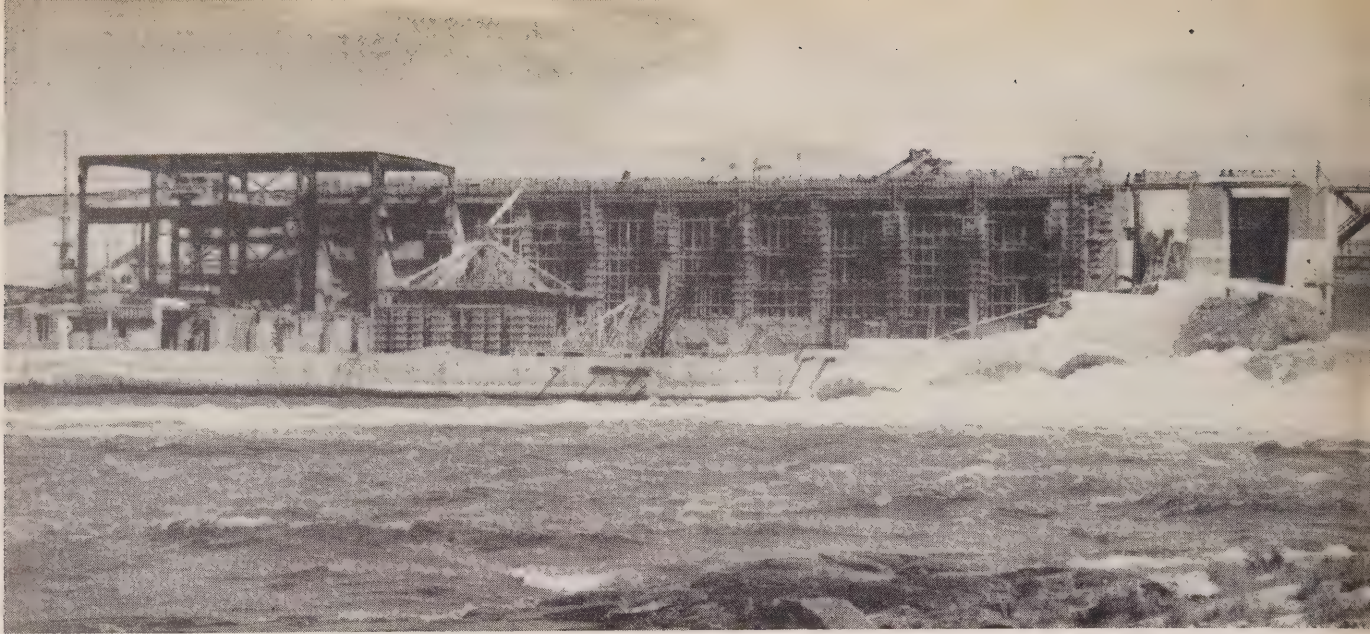


### FOR BEAUTY AND POWER

Ontario Hydro construction forces are striding rapidly forward with the building of the 1,550-foot Grass Island Pool control structure on the Canadian side of the Niagara River. This recent aerial view shows the satisfactory progress achieved in construction associated with the largest phase of the important Niagara remedial and preservation program. Undertaken jointly by Ontario Hydro and the Corps of Engineers, United States Army, the international project, which also involves excavation and filling along both flanks of the

Horseshoe Falls, is designed to preserve the scenic beauty of Niagara Falls and to ensure the most effective use of Niagara water for power production. The control structure, which will consist of 13 sluiceways equipped with 150-ton submersible-type gates, will serve the primary function of controlling the level of the Chippawa-Grass Island Pool in the upper Niagara River for power production, at the same time ensuring that the American Falls spectacle remains unimpaired.





## MANITOU FALLS GENERATING STATION

# AHEAD OF SCHEDULE

**F**ROM an isolated, virtually inaccessible site on the English River, some 1,400 miles northwest of Ontario's capital City of Toronto, has sprung the full-fledged, Ontario Hydro community of Manitou Falls with a population close to the 500 mark.

It is at this picturesque spot, in the heart of the rugged Kenora forest, that engineering genius has combined with the skill of men of many nations to transform Manitou into another source of hydro-electric power for the mines, the mills and the citizens of northwestern Ontario.

Two years ago it was just a 25-foot cascade in the swift-moving river. The only means of access to this now-busy spot was by boat, air or by tortuous foot travel over rugged terrain, through heavy stands of timber.

Today, a smooth, 13-mile access road connects the project with

Highway 105 (known locally as the Red Lake Road), which runs north from Highway 17; some 65 acres of heavy bush have given way to the rows of white buildings which comprise Manitou's camp, while the building of a massive, 1,100-foot concrete dam and powerhouse across Manitou Falls is in full swing.

Those early days of 1954 when melting snows and spring rains turned the temporary winter road into an impassable morass have been forgotten. Since then almost 400 or more men of approximately 20 nationalities — many of them with wives and children — have come to Manitou.

Although destined for only a temporary existence, by virtue of the primary function it serves, the Manitou campsite boasts of such modern amenities as a 12-man hospital, complete with operating and X-ray facilities; a two-room school to accommodate 50 pupils and

teaching both primary and continuation school grades, as well as a recreation hall equipped with bowling alleys, billiard tables, table tennis equipment and facilities for movie presentations. The camp commissary, stocking many of the commodities and foodstuffs found in the average rural general store, is also housed in the recreation hall.

### Staff Accommodation

Elsewhere in the "village" will be found the cafeteria, capable of feeding approximately 600 men; six, 80-man dormitories; a trailer camp and several homes for members of the engineering and administrative staffs, as well as special living quarters for female and clerical employees.

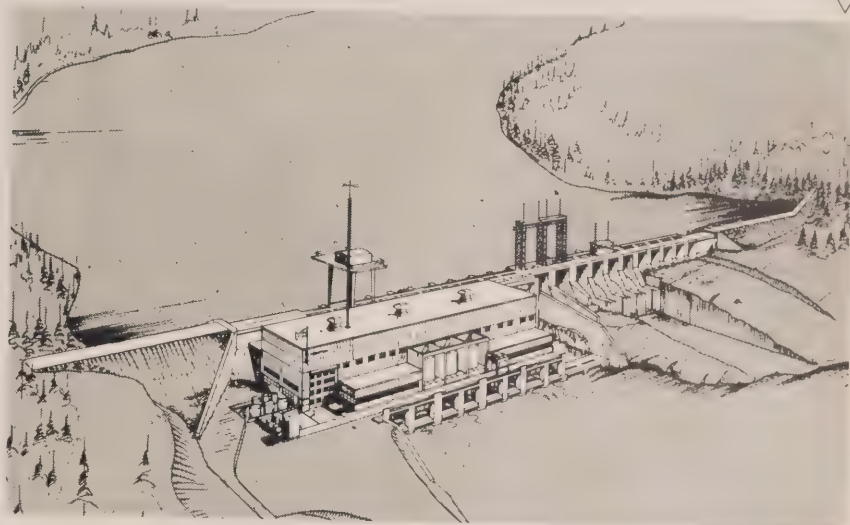
With such accommodation, Manitou has moved forward ahead of schedule almost since the day the first power shovel arrived at the site.





◁ GENERAL downstream view of the Manitou Falls project, showing the bypass sluiceway section (right), through which the English River is being diverted while construction of other sections of the main dam and powerhouse (left), is in progress.

ARTIST'S perspective of Manitou Falls Generating Station as it will appear when completed next year.



ANOTHER downstream view of the project with erection of the powerhouse superstructure in progress (left). Formwork on the face of the dam indicates placing of headworks concrete.



# DULE

In the preliminary phases of actual construction, a temporary diversion channel, 200 feet in length, was excavated along one bank of the river, involving the removal of some 28,000 cubic yards of rock and earth. At the same time, construction of cofferdams — upstream and downstream from the powerhouse area — proceeded. With this work completed, the river was diverted into its new, man-made channel, allowing a start on construction of the main dam and powerhouse in the unwatered area behind the rock-and-timber cofferdams.

Today, the visitor finds the main construction activity centred on the placing of concrete and installation of equipment for the powerhouse and headworks. Manitou's headworks structure — an integral part of the powerhouse — reaches to a maximum height of 95 feet above

*(Continued on page 4)*





IN A few months the upstream level of the river will be raised 30 feet to form a head-pond for the development. This view shows the upstream cofferdam and the headworks portion of the main dam (right), as well as the bypass sluiceway section of dam (left).

MAINTAINING an accelerated schedule set for the project, this crew is assembling the head cover of a turbine for one of the four units, which will be in operation in 1956.



bedrock. Completion of the project will require the pouring of some 42,000 cubic yards of concrete.

Erection of steel for the powerhouse superstructure is in progress, while installation of turbine components for the plant's initial four units — scheduled for operation next year — is also under way.

Indicating the satisfactory progress at this northern development is the fact that two of the plant's units are expected to be ready for service by April next year — three months ahead of schedule. Credit for this achievement is ascribed to the smooth and efficient functioning of the engineering and construction staff "in the field" under Project Manager P. G. Campbell. Completion of the headworks structure in a period of seven weeks is cited as a cogent example of this team's well-coordinated efforts. With an advanced schedule to meet, erec-

tion of generating equipment for the initial two units will be under way during the next few weeks, while a corps of workmen will concentrate on the removal of the upstream cofferdam, preparatory to inauguration of the "closure" operation. This involves the placing of reinforced concrete rollways in the bypass sluiceway section of the dam and the gradual raising of the upstream water level. Regarded as one of the major, final phases in hydro-electric development construction, closure work will be carried out in successive stages between November this year and March, 1956, by which time the water will have been raised about 30 feet to its full operating level.

With an operating head of 55 feet, this new development will raise the level of the river for a distance of five miles upstream to join with the existing level of the water in a 12-mile section of the English River below Hydro's Ear Falls Generating Station. Provision for flooding in the five-mile area above Manitou Falls has necessitated the clearance of some 800 acres of bush and trees lying adjacent to the river banks where the main flooding is to take place.

The significance of this new station and the role it is destined to play in meeting the increased load growth of Hydro's Northwestern Region, was re-emphasized by the

*(Continued on page 28)*



# HYDRO AND THE "MATCH"



GORDON McHENRY, Consumer Service Engineer, Western Region (left), presents Ontario Hydro's prize to Carl Timbers, Stouffville (right), during the monster, "wind-up" banquet. Clark Young, Treasurer, Ontario Plowmen's Association, is holding the Commission's trophy.



DEMONSTRATING the use of heat lamps in calf-brooding, this frisky Holstein heifer in a miniature stall was the centre of attention as hundreds of visitors inspected the displays in the big Hydro tent.

ONE of the most unusual agricultural competitions in the world, Ontario's 1955 International Plowing Match near Leamington attracted approximately 600 entries in the 42 classes open for competition. Marking its 42nd anniversary, this year's "match," which was witnessed by an estimated 80,000 people, also featured a 12-class farm welding competition and the Western Ontario Cash Crop Days program. Held in conjunction with the match for the first time, the Cash Crop Days event was started five years ago in Middlesex County as a county project. Since then, it has developed to include all southwestern Ontario counties where cash crops are grown.

With this year's "Tented City" covering a distance of some two miles of frontage on three "streets," Ontario Hydro's Kingsville Area Manager, H. E. Chapman, and his line crew were busy erecting temporary lines to provide electrical service for some 225 exhibitors and 11 caterers. Ontario Hydro itself, was among the exhibitors again, with such interesting displays as a model of an electrified farm, a unique model of a nuclear-electric plant and the Commission's St. Lawrence model (see *Ontario Hydro News*, October, 1955). Attracting particular attention was the "live" demonstration of the use of heat lamps in the brooding of calves, complete with a miniature box stall and a sprightly Holstein calf.

Another Commission contribution to this year's event, was the presentation of the first prize to the winner of the Class 16—Tractor (Tricycle Type only—two or more furrows) plowing competition. Won by Carl Timbers, Stouffville, the Hydro prize—a fractional-horsepower motor—was presented by Gordon McHenry, Consumer Service Engineer, Western Region, on behalf of the Commission. ■

# "HYDRO WEEK" PROPOSED

**District 6 O.M.E.A. Delegates**

**Favor Special Observances**

**To Commemorate Hydro's 50th Anniversary**

**M**ORE than 150 delegates at the recent annual convention of District No. 6, O.M.E.A., held at Goderich, registered unanimous approval of a resolution from the executive that the Ontario Municipal Electric Association and its members mark the 50th anniversary of the founding of Ontario Hydro with a "Hydro Week" during 1956.

The resolution was as follows:

"Whereas 1956 will mark the 50th anniversary of Ontario Hydro, therefore, be it resolved that the O.M.E.A. appoint a committee to set aside one week in 1956 for a suitable province-wide celebration of this event, and that every P.U.C.

HIGHLIGHT FOR DISTRICT 6 CONVENTION DELEGATES WAS A YACHT TRIP AROUND GODERICH HARBOR







◁ MEMBERS of the newly-elected executive, left to right: R. G. Charlton, Hespeler; R. B. Hanna, Listowel, Secretary-Treasurer; T. J. Moffat, Listowel, President; Howard M. Scheifele, Waterloo; H. O. Hawke, Galt; Mayor J. E. Huckins, Goderich; A. E. MacIntyre, Stratford; George H. Glover, St. Mary's, 1st Vice-President; and D. F. Kissner, Kitchener, are shown as they held their first meeting.

office be appropriately decorated for the designated week."

The delegates also approved a motion that the "district go on record as favoring a policy leading to a uniform wholesale cost of power to all cost municipalities in the near future."

In his opening remarks, President T. J. Moffat said that the district officers are proud of their record of 100 percent attendance at all executive meetings. As president, he attended annual meetings of five other district associations, Mr. Moffat reported. The speaker also expressed his thanks to the directors and the Secretary-Treasurer, R. B. Hanna, for their excellent support. He referred feelingly to the loss, during the year, of two valuable friends of the association, George Gordon, a past president, and Ivan Shantz, a director.

Following the short morning business session, and an enjoyable boat trip, which gave the visitors a splendid view of Goderich's famed Lake Huron harbor, luncheon was served at the Legion Hall. Mayor J. E. Huckins welcomed the guests to Goderich on behalf of the town

council and the public utilities commission, pointing out that it was the first district convention held in the community.

Jack Mowat, Manager, Electric Service League of Ontario, started the busy afternoon session with an interesting film on adequate wiring. He told the gathering that the Central Mortgage and Housing Corporation now allows higher mortgages on homes conforming with adequate wiring specifications.

#### Panel Discussion

Ontario Hydro Vice - Chairman W. Ross Strike led a panel discussion on the use of Ontario Hydro's annual report, which has been a highlight of other district association meetings in recent months. R. S. Reynolds, Chatham; A. J. Girdwood, Guelph, and George Glover, St. Mary's, also served on the panel. Mr. Strike, giving a history of the blue-bound volume, said that Hydro's annual report is very important to people associated with the electrical industry, reaching almost every country of the world.

"We have found, through personal contact with engineers from other countries," said Mr. Strike,

REPRESENTATIVES of the Electrical Employers' Association of Ontario demonstrate the most effective method of lowering an injured line-man from the top of a pole to the ground.



"that they know as much as we do about the Sir Adam Beck-Niagara Generating Station No. 1. They have learned about it from our annual reports, because at the time it was built, it was considered to be one of the best engineering jobs of its kind in the world."

(Continued on page 8)





△

ATTENDING his first O.M.E.A. meeting as Hydro's Vice-Chairman, Hon. W. K. Warrender, right, chats briefly with T. J. Moffat, Listowel, and H. A. Howard, A.M.E.U. President.



△

DISCUSSION led by, left to right: G. H. Glover, St. Mary's; A. J. Girdwood, Guelph; W. Ross Strike, Hydro Vice-Chairman, and R. S. Reynolds, Chatham, was a popular feature.

Mr. Reynolds recalled that he had made extensive use of Hydro's Laboratory for the testing of transformer oils, rubber gloves, blankets, hose, etc., after reading accounts of research activities in the annual reports.

Referring to the annual reports of municipal utilities, he expressed the opinion that local commissions should expand and amplify the section pertaining to financial operations, similar to the manner of presenting such summaries in the Commission's report.

Each commission should specify or present a breakdown of individual expenditures, Mr. Girdwood agreed, showing what is involved in the total figure. This is necessary for an accurate comparison with the same figure of another municipality.

In the course of the lively discussion, Mr. Reynolds posed a series of questions for the consideration of local commissioners: "Is the staff interested in the utility, or is it just working there? Are your wages high enough? Do you encourage your staff to take part in commun-

ity activities? Do you provide extra training for your staff? How much do you interfere with your staff? Do you set the policy and let the staff carry it out? How many of the local utilities are in the pensions and insurance scheme?"

### Consumer Service

A paper on the function of consumer service was presented by Douglas J. Gordon, Municipal Service Engineer, in the unavoidable absence of I. K. Sitzler, Hydro's Director of Consumer Service. Fire insurance for utilities was discussed by H. O. Hawke, Galt, resulting in approval of a resolution that a committee be set up to study insurance rates and report back to the next annual meeting.

As at other district conventions in recent weeks, representatives of the Electrical Employers' Association of Ontario gave a remarkable demonstration of rescuing linemen from poles and applying artificial respiration. The demonstration was under the direction of Donald Cameron, Secretary-Treasurer.

Before the meeting closed, President Moffat recommended that municipal commissioners participate in tours of Ontario's Hydro's Head Office at 620 University Avenue, Toronto. He also announced that the 1956 convention would be held at Waterloo.

The following executive was elected by the delegates to serve for the ensuing year: President, T. J. Moffat, Listowel; Secretary - Treasurer, R. B. Hanna, Listowel; A. J. Girdwood, Guelph, Past President; George Glover, St. Mary's, First Vice-President, and H. O. Hawke, Galt, Second Vice-President. Named district directors were: A. E. McIntyre, Stratford; Dr. H. A. Mutton, Mitchell; R. G. Charlton, Hespeler; Mayor J. E. Huckins, Goderich; D. F. Kissner, Kitchener; J. H. Francis, Tavistock; and H. M. Scheifele, Waterloo. — *By A. H. Brown.*



# PHENOMENAL TREND

Hydro is making provision for future load growth in northwestern Ontario

ALTHOUGH load growth in northwestern Ontario has shown a "phenomenal" trend in recent years, the potential power resources of Ontario Hydro's Northwestern Division are sufficient to meet future demands for several years.

Delegates greeted this assurance from A. W. Manby, Ontario Hydro's General Manager, during the recent District 3 O.M.E.A. Convention, with considerable approval. Held at Nipigon this year, the annual meeting attracted over 80 delegates from various Ontario municipalities as well as guests from other points outside the province.

As principal speaker at the main banquet with Vice-Chairman W. Ross Strike, Mr. Manby traced the steps the Commission has taken in recent years to augment power output in northwestern Ontario.

In this connection he mentioned the two-unit addition to the Pine Portage Generating Station on the Nipigon River (completed in December, 1954), which had doubled this plant's initial capacity.

In addition, the Commission has the Manitou Falls Generating Station on the English River under construction. This new station will add 75,300 horsepower to the resources of the Northwestern Division when completed in 1956 (see Page 2).

## New Project

To meet increasing load growth, Hydro recently authorized construction of its Whitedog Falls Generating Station on the Winnipeg River. Scheduled for service late in 1957, it will further augment the capacity of the northwestern Ontario system, while plans are being made to harness the energy of other sites in this region to keep pace with rapidly growing demands.

At the same time, Hydro is conducting negotiations for an interconnection with the Manitoba Power Commission's system, which would provide a further margin of system capacity. Thus, ample provision is being made to ensure the availability of adequate blocks of power for industrial and municipal

expansion in the area served by the Northwestern Division.

## System Interconnection

Dealing momentarily with the value of system interconnection, Hydro's General Manager predicted the eventual linking of the electrical

*(Continued on page 10)*

ALTHOUGH singularly shy, members of the newly-elected executive of District 3, including, left to right: Front row — Dr. M. P. Benger, Port Arthur; C. H. Moors, Fort William, President; E. A. Vigars, Port Arthur; Secretary-Treasurer, Back row — E. R. Freeman, Port Arthur; Eric Newman, Kenora, and Reeve George O'Neill, Nipigon, posed for this photograph.



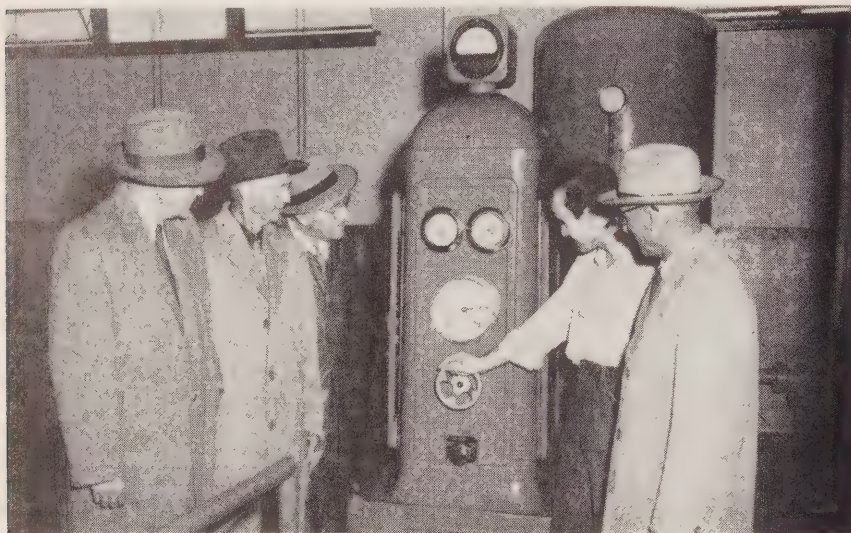
W. L. WADE, Superintendent, Nipigon Hydro Commission (left), who was in charge of arrangements for this year's convention, is shown with, left to right: E. R. Freeman, Reeve George O'Neill, and Secretary-Treasurer E. A. Vigars, while discussing last-minute details.







△ FOLLOWING a pole-top rescue demonstration, Charles Sodergren, Nipigon (left), tests a lineman's belt during a discussion with Bryn Jones, a representative of the Electrical Employers' Association of Ontario and J. D. Phillips, of Schreiber, a veteran member of the O.M.E.A.



△ LOU EDMONDS, second from right, First Operator at Hydro's Aguasabon Generating Station, explains the function of a governor to, left to right: D. A. McCuaig, Winnipeg; R. A. Taylor, Fort Frances; Florian Zechner, Nipigon, and E. T. Calder, Fort Frances, during a plant tour.

systems of Hydro's Northwestern and Northeastern Divisions.

The importance of such a step has been demonstrated in recent weeks by the existing link between Hydro's Southern Ontario System and the Northeastern Division, he stated.

With low water conditions prevailing in the reservoirs of the latter system, resulting in a substantial reduction in the output of its gen-

erating sources, it has been necessary to transmit power from the Southern Ontario System, in order to meet power demands in northeastern Ontario.

Summing up, Mr. Manby said: "We are looking to the day when we will have a completely integrated system throughout the entire province."

Continuing his references to future power demands, the speaker

mentioned the fact that future expansion in Northwestern Ontario could, eventually, exhaust the present hydro-electric resources.

#### Alternative Method

"It is possible that some day, we shall have to find an alternative method of producing power for this section of Ontario. Thus, it becomes evident that nuclear-electric energy is as important to you as it is to Southern Ontario."

Speaking in a similarly optimistic note, Mr. Strike described the 20th century as "Canada's century."

Industry, he said, is looking for sites where fresh water is available in large quantities and it is only in the Great Lakes basin that such locations exist.

With uranium and other minerals available in northern Ontario in seemingly ample quantities, and still further expansion of the pulp and paper industry impending, the potential development of the province's northern areas is "tremendous."

"It would seem that we have just tickled the surface," Mr. Strike stated.

#### New Burdens

Future expansion, he continued, will place new burdens and responsibilities on municipal electrical systems and the men who administer these systems.

"It is evident that municipal commissioners will have to give their managers and their staffs more attention and more cooperation."

Presiding at this year's convention was President E. R. Freeman, Port Arthur, who conducted the lively business session held in the Nipigon High School auditorium.

Considerable interest was manifested in the summary of operations of Hydro's Northwestern Region presented by J. W. Looney, Operations Engineer.

In his review of primary peak demands, Mr. Looney reported that they reached 364,000 horsepower in 1954, an increase of more than 13 percent over the 1953 figure. Peak



demands to the end of September, 1955, have already passed 400,000 horsepower, an increase over the annual peak of 1954 of more than 15 percent.

By September this year, 10,089 rural customers were being served over 1,835 miles of rural primary line in the Northwestern Region.

Another feature of the business session was a thought-provoking address on the future expansion of municipal systems by I. K. Sitzler, Director, Consumer Service, Ontario Hydro.

### Municipal Loads

In his remarks, Mr. Sitzler predicted the possibility that municipal loads will be double their present figure by the end of the next decade.

Stressing the importance of adequate planning to meet these increased demands, the speaker cautioned that they would impose a "multitude of complex distribution problems."

Utilities, he continued, will have to give consideration to the installation of heavier and duplicate distribution lines and the construction of additional substations to handle the increased electrical demands.

At the same time, municipal systems will be under increasing pressure to improve the appearance of their distribution facilities. "Thus, new types of equipment and methods of construction will be necessary to reach this objective."

### Rate Structures

With load increases will come the necessity of revising rate structures to provide a proper assessment of costs to customers. In this connection, the speaker mentioned that this problem is receiving continuing attention by the Commission's Rate Study Engineer, in consultation with the A.M.E.U. Rates Committee.

In concluding his address, Mr. Sitzler reminded his audience that Hydro's regional staffs stand ready to assist municipal utilities in solving the many problems that will

(Continued on page 27)



△ MEMBERS and staff representatives of Etobicoke Hydro-Electric Commission, left to right: John Irvine, Frank Nash, Clarke Wardlaw, William Marsh, Dr. V. S. Wilson, Victor Duggan admire the aplomb of David E. Livings as he tries the new boat presented by his colleagues.

## HONOR RETIRING FOREMAN

After a working career of 52 years, David E. Livings, General Foreman, Etobicoke Hydro-Electric Commission, retired recently — on the eve of his 65th birthday — amidst the tributes and best wishes of his utility colleagues.

In commenting on his life of useful accomplishment, Mr. Livings recalled that he had started work in a brickyard when he was only nine years old, a 60-hour week netting him two dollars. During the winter months he went back to school, leaving when he was 13 to work in a cycle factory assembling pedals and wheels. Other work as a gardener and butcher followed, until, at 17, he made his first contact with Hydro by working for a contractor building transmission towers between Ancaster and Brantford. At 20 he joined Ontario Hydro, being engaged in line maintenance in the Niagara District.

His 30-year association with the Etobicoke Commission began in

1925 when, on the invitation of Superintendent William Marsh, he joined the service department. His varied duties included restoring service, collecting accounts, meter work and taking charge of a line construction crew. In 1949 he was appointed General Foreman.

Mr. Livings summed up his 52 years of work with the remark: "It's been a long and happy life and if I were 30 years younger I'd be helping to build the St. Lawrence Power Project."

At a party in his honor in the Islington Canadian Legion Hall, Mr. Livings' associates presented him with a boat, bearing his nickname of "Kingfish" in gilt letters.

Etobicoke Commission Chairman Dr. V. S. Wilson extended sincere wishes for a long and happy retirement, while newly-appointed Commissioner Clarke R. Wardlaw presented Mr. Livings with a 5½-horsepower motor for his new boat on behalf of the commission. ■

Stationed at strategic points across the province, Commission inspectors wage a never-ending campaign to promote safe electrical practices and safe wiring

by E. W. McLEOD\*

# Power G

ARTIST'S conception of the author, E. W. McLeod, Ontario Hydro's Chief Electrical Inspector, holding a new, three-prong attachment plug-cap, left, and the three-conductor receptacle, right. These new devices are now being used to promote greater electrical safety in Ontario homes (see reference on Page 15).

*This article formed the basis of a paper presented at a recent convention of the American Institute of Electrical Engineers.*

ONTARIO covers an area of 412,582 square miles, more than half again as large as the State of Texas. If the southern border of this Canadian province was hinged and turned over, the Province of Ontario would cover the following of the United States: Connecticut, New Hampshire, Maryland, Maine, Kentucky, Indiana, Virginia, Tennessee, Pennsylvania, Mississippi, New York and Ohio.

Over this vast area, almost a million-and-a-half customers are served directly and indirectly by Ontario Hydro, one of the largest electrical utilities in the world. Its customers

are not all urban, by any means; more than 400,000 are rural.

Few electric utilities have to meet this challenge of distance and service. Still fewer have our unique opportunity to collect data over such a wide area and from so many sources in regard to the causes of electrical accidents and fires and the means for their prevention.

Located strategically throughout the province, Ontario Hydro maintains a force of 155 electrical inspectors. One of their duties is to funnel all information regarding electrical fires and accidents to Ontario Hydro's Head Office in Toronto. An accident or fire on a customer's premises, attributed to electrical causes, occurring anywhere in the province is the subject of a report that reaches my desk. In this way,

\* Mr. McLeod is Ontario Hydro's Chief Electrical Inspector.

at the end of a given year, we have a picture of the situation in Ontario in regard to fatal accidents and fires of electrical origin.

## Fatal Accidents

This is the way the picture looked from 1950 to 1954:

Year	Fatal Accidents	Fires
1950	9	13
1951	16	18
1952	13	15
1953	13	18
1954	14	23

Let us consider first the problem of fatal accidents.

For our purposes, we will discuss three categories:

- (a) Accidental contact with high voltage lines.
- (b) Fatalities in industrial occupations.
- (c) Fatalities in or around the home.



▷ A MEMBER of Ontario Hydro's 155-man staff of electrical inspectors, Harvey Putnam, checks the connection and thermostat of a new electric water heater as part of his inspection of the wiring installed in a new home near Toronto.



# ardians

**WARNING  
TO OPERATOR**  
REGARDING HYDRO WIRES  
OVERHEAD OR UNDERGROUND

• CONTACT BY THIS MACHINE  
WITH HYDRO WIRES CAN  
COST YOUR LIFE.

• DAMAGE TO HYDRO WIRES BY  
THIS MACHINE MUST BE PAID  
FOR BY THE OWNER.

• FOR SAFETY ADVICE OR  
ASSISTANCE CALL YOUR  
LOCAL HYDRO OFFICE.

FOR YOUR INFORMATION BY THE CONSTRUCTION SAFETY ASSOCIATION AND HYDRO-WIRES



THESE warning notices to operators of cranes and large shovels, made of special durable paper and attached to the machines by an all-weather adhesive, are designed to minimize contact with high voltage lines.

## Remedy

Our regulations specify clearances between high voltage conductors and wells, metal flag poles, silos, etc., which have been increased in recent years to the values appearing in Tables I and II. There is evidence that this has helped to some extent.

(Continued on page 14)

TABLE I

CLEARANCES FROM POWER LINES TO BUILDINGS IN RURAL AREAS

VOLTAGE	VERTICAL LINE TO BUILDING	HORIZONTAL LINE TO BUILDING	VERTICAL LINE TO TOP LEVEL OF BARN DOOR OR ENTRANCE TO HAYMOW	HORIZONTAL LINE TO TOP LEVEL OF BARN DOOR OR ENTRANCE TO HAYMOW
NOT OVER 750 VOLTS	6 FT.	3 FT.	—	—
750 TO 15,000 V.	10 FT.	20 FT.	10 FT.	20 FT.

CONDUCTORS OPERATING AT MORE THAN 150 VOLTS TO GROUND SHALL NOT BE ERECTED WITHIN 20 FT. MEASURED HORIZONTALLY FROM FLAGPOLES AND WINDMILLS.

TABLE II

CLEARANCES FROM POWER LINES TO SILOS AND WATER WELLS IN RURAL AREAS

VOLTAGE	LENGTH OF POLE	HORIZONTAL DISTANCE FROM SILO OR WELL
OVER 150 VOLTS TO GROUND	25 FT.	40 FT.
"	30 FT.	40 FT.
"	35 FT.	35 FT.
"	40 FT.	30 FT.
"	45 FT.	25 FT.
"	50 FT.	15 FT.

(While it would be obviously impossible to go too deeply into details, I would like to illustrate each category with condensed reports of fatal accidents on our files at Ontario Hydro. More detailed information will be furnished on request).

### (a) Accidental Contact with High Voltage Lines.

(1) A young farmer was removing a suction pipe from a water well. The suction pipe was raised from the well and through the roof of a pump house, contacting a live, single-phase primary line of 7,200 volts. Since the victim was touching the pipe, he received the full line voltage, causing death.

(2) A laborer received a fatal shock working at a construction site. He was assisting a crane operator to guide a steel I-beam being hoisted into position by a crane. The crane contacted a live, 26-kv, 3-phase primary line.

(3) A large load of steel was being moved by a crane. A workman guiding the load was electrocuted, when the boom on the crane contacted a live 2,200-volt line.

The year 1952 was a peak year in Ontario for electrical accidents attributed to the contacting of high voltage overhead lines, in that 48 percent of all electrical accidents in the province during that year were due to this cause. Warning notices made of a special durable paper and attached to cranes with an all-weather adhesive are, at present, being tested by our Safety Officer.

We are still presented with a real problem insofar as mobile cranes, booms, etc., contacting high voltage conductors are concerned; we are still struggling to come up with a satisfactory solution.

## (b) Fatalities in Industrial Occupations.

(1) A foreman baker was electrocuted when cleaning a dough mixing machine, which had been recently moved from its original position. The armoured cable wiring to the machine had inadvertently been pulled from the cable connector, thus eliminating the ground connection. The cable was damaged, and a bare conductor contacted the machine. The supply was 220 volts, 3-phase A.C.

(2) An employee of a large electrical firm received a fatal electrical shock when changing the water-line hoses of an electronic welder rated

at 20-kva, 550 volts. He failed to open the switch supplying the welder. The victim apparently contacted a steel water pipe and live part of the welder.

(3) A workman was electrocuted in a foundry. A three-prong attachment plug cap had been tampered with to fit into a convenience receptacle and electrically charged the frame of a portable sand-sifting machine, which the workman was handling at the time of the accident.

## Remedy

Automatic grounding of non-current carrying metal parts of portable electric tools used in industrial establishments has been required by Ontario Hydro for over 25 years and has helped materially in saving lives and in reducing accidents. (An extension of this principle is referred to a little later in this article.)

Industry has come a long way in the past few decades in making itself and its workers safety-conscious. But there is still a hard road to travel, one in which management must assume the leadership, assisted by an enlightened labor.

In electrical accidents, as in other industrial accidents, the importance of proper maintenance of equipment and the significance of that equipment's immediate and careful repair cannot be too greatly emphasized.

The remedy certainly lies in re-emitting safety education and the fostering of safety consciousness in all its aspects with those concerned.

## (c) Fatalities in or around the home.

(1) A high school principal was electrocuted while working with a home-made electric drill under an auto-trailer parked on very damp ground. An investigation indicated that the frame of the drill was alive at the time of the accident, due to failure of insulation between live electrical parts and the motor frame.

(2) A baby boy was found dead

**ONTARIO HYDRO**  
*Rural Lines*  
VOLUME 8 Spring - Summer, 1955 NUMBER 1

**ONTARIO HYDRO TO ADD 30,302 CUSTOMERS  
1441 MILES OF LINE IN '55 RURAL PROGRAM**

**HYDRO SERVICE WILL SOON  
SURPASS 400,000 CUSTOMERS  
IN PROVINCE'S RURAL AREAS**

**23,000 BOXED TURKEYS SHIPPED  
FROM COOKSVILLE IN 1954**

### PLAY IT SAFE

- "SAFETY FIRST" is still a very important slogan with reference to electrical equipment. For the greatest benefits from your Hydro service, with maximum safety, we offer these suggestions:
- ★ Install adequate wiring for all electrical equipment in homes, barns and other buildings.
  - ★ Have wiring done by a competent electrical contractor and duly inspected.
  - ★ Look for the C.S.A. label on all electrical equipment and appliances. This certifies that they have been approved by the Canadian Standards Association.
  - ★ Keep wiring, outlets, switches and appliances in a good state of repair, thereby avoiding hazards of shock or fire.
  - ★ Never touch a fallen wire! Have your Hydro office notified at once. Stand guard until proper safety measures have been taken.
  - ★ Teach children good safety practices. Ingress on them the danger of going near Hydro rural, safety electric motors and other equipment.
  - ★ If in doubt about any electrical problem, get in touch with your Hydro Area office for advice or guidance.

### NEW RURAL HYDRO BILL

This new Rural Hydro bill will save you a considerable saving in money and handling cost. You will receive more information about this new bill later. Please wait for it.

### UNDERWRITERS STRESS FARM FIRE HAZARDS

At the annual convention of the Mutual Fire Underwriters Association of Ontario, attention was drawn to the hazards of electricity on farms. The Association stressed the importance of proper wiring and the deterioration of wiring through dampness or rodents.

Ontario Hydro has always recommended that farm electrical installations be inspected and approved by a competent electrical contractor. Hydro's Rural Lines Division, in cooperation with the Ontario Electric and Gas Commission, has developed a program of rural safety and conducted short courses for the use of proper wiring and the correct fitting of bonded circuits at the point of line and shock hazards.

### Taking Precaution

During the past few years, the number of farm fires has increased. In addition to the many fires caused by faulty wiring, the use of open flames for heating and cooking has increased. The use of open flames for heating and cooking has increased. The use of open flames for heating and cooking has increased.

STRESSING the importance of electrical safety on the farm and in rural areas is Hydro's widely-read publication, "Rural Lines," which is distributed to rural customers.



(4) A small child, while being bathed in a kitchen sink, touched a defective appliance plug connected to an electric toaster. The spring of the appliance plug became electrically charged, due to the frayed condition of the cord within the appliance plug.

## Remedy

You will note the diversity of electrical equipment involved in the accidents around the home—a toaster, a metal floor lamp, an electric drill and an electric grinder. Portable devices have always given the safety engineer particular concern as against stationary devices because, generally speaking, non-current-carrying metal parts of stationary devices can be adequately grounded without too much trouble. To assist the portable device situation the NEMA standard attachment cap plug and receptacle were developed.

Ontario Hydro realized the potential safety features of NEMA'S standardizing accomplishment and, as of June 1, 1955, has passed a regulation that there shall be one of these receptacles in each breakfast room, kitchen, laundry and utility room of every new dwelling built. There must be a separate circuit to each room referred to above and there must not be more than two receptacles on



## MODERN ELECTRICAL

*Living calls for...*  
**ADEQUATE WIRING**

Inadequate wiring does more than just blow fuses... it dims lights... makes motors run slowly... prevents heaters and stoves from heating to their full capacity... in short, it lowers the efficiency of today's modern, electrical aids to living.

Modern Electrical Living calls for Adequate Wiring. If you're planning to buy, build or remodel insist on wiring to the R.E.D. S.A. Standard.

Write today for the FREE BOOKLET, "Adequate Wiring Tells Living Tomorrow." The Electric Service League of Ontario, Toronto.



## SENTINEL of your Electrical Circuit

Not all the romance of electricity is in lovely machinery. Many small devices are a behind the scene. Consider the fuse. Tiny and inconspicuous, yet it is a precision built safeguard, installed to prevent damage which might result from over-current circuits.

When a fuse blows, replace it with another of the correct size. If it is conspicuous call to remember, the fuse is a protection and make it useful for you to report with safety, all the burning that low cost electricity brings into your home.



## NEVER TOUCH a fallen wire!

Don't touch a wire that has fallen to the ground. It may be live and it may be dangerous. It may be a live wire.

Never touch a fallen wire under any circumstances. Warn children not to touch it. If it is in the way, call the nearest Hydro office and endeavor to keep it away until service men arrive. Your co-operation may be instrumental in saving a life.

HYDRO'S program of electrical safety education also features advertisements—similar to those reproduced above—as well as articles, emphasizing the need for adequate wiring and other safety precautions and published in daily and weekly newspapers.

any one of these circuits. It is felt that the automatic grounding of non-current-carrying metal parts of portable electric equipment is a

ONTARIO HYDRO  
AT WORK FOR YOU AND YOURS

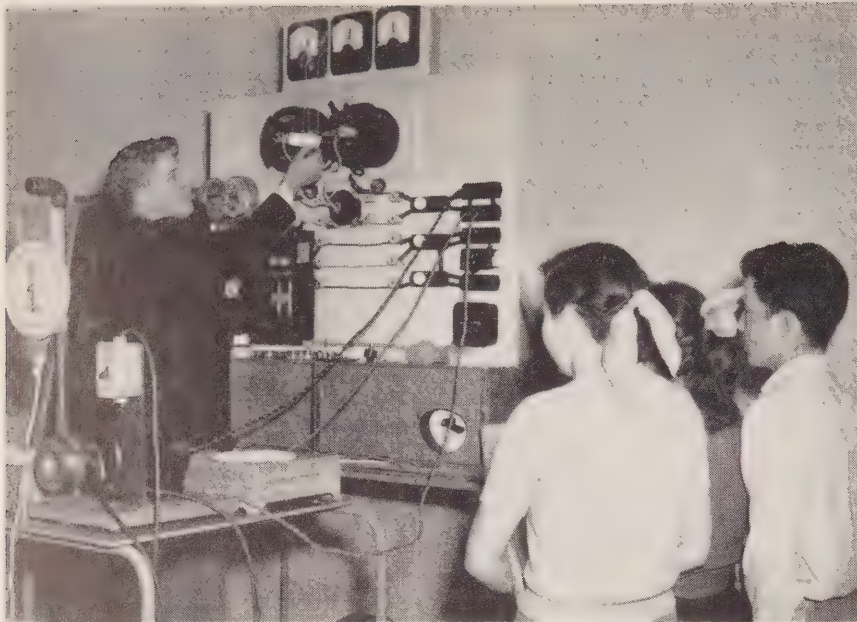
any one of these circuits. It is felt that the automatic grounding of non-current-carrying metal parts of portable electric equipment is a safety measure of considerable importance.

In some quarters, the hope has been expressed that ultimately the NEMA receptacle will replace all others, and I look forward to that day. Even the floor lamp fatality should be a thing of the past, when NEMA receptacles invade the living room, dining room, bedroom and any other rooms, for that matter, where electric outlets are needed. There will be a transition period, with some problems for which suitable adapters can serve a useful, and, we hope, only a temporarily-needed purpose. NEMA receptacles are here to stay as far as we can see at Ontario Hydro.

(1) Inspecting a residence following a fire, it was found that joints were loose and unsoldered. Branch circuits were overfused and the fuses failed to open. Liberal use was made of lampcord and cab tire flexible cord for circuit wiring.

(2) A duplex convenience receptacle was used to supply a 1500-watt kettle and plug-in type range. The receptacle received its supply through a No. 18 B & S Gauge lamp cord which, due to the overloading of the circuit, heated up and set fire to the wall of the premises.

(Continued on page 16)



△

THIS Commission demonstration panel tours rural areas showing what occurs when electrical hazards are created. Here, W. S. Urquhart, a Hydro farm service adviser, illustrates the effect of an overloaded circuit, using a piece of paper to show the amount of heat generated.

(3) A fire started in a residence, due to a short circuit in an extension cord, occurring at a point where the cord had been supported on a metal hook. The circuit was overfused and the wires in the extension cord had been welded together.

(4) A fire started in a church, where a fixture conductor was pressed between a junction box and the box cover. Insulation on the conductor failed and the resulting arc caused molten metal to fall on highly inflammable paper used as a cover on rock wool batts.

(5) A fire occurred in a home, where subsequent inspection revealed that joints in the attic wiring (which consisted of non-metallic sheathed cable, armoured cable and cab tire cable) were neither soldered nor were connectors used. Heating occurred in the wiring joints, burning the conductor insulation and setting fire to the roof of the premises.

(6) It was reported that a fire started near the edge of a linoleum rug in a home. A 2-wire lamp cord

had been run underneath the rug, and the circuit supplying the cord was overfused. Further investigation showed that the lamp cord had short-circuited and set fire to the conductor insulation.

(7) A fire started in a home due to the omission of anti-short bushings in an armoured cable installation. The insulation on the conductors had been severed by the metal armouring of the cable, short-circuiting the conductors. A 30A fuse failed to open, and the ensuing fire spread to the ceiling of the premises.

### Remedy

The remedy for fires due to electrical causes, as you know, lies in a steady program of public education.

The inspectors of Ontario Hydro are responsible for the enforcement of 1,205 regulations, somewhat similar to the NE Code. Despite these regulations, fires, such as those I have described, still occur.

At the grass-roots, our inspectors report on every fire of this nature,

and endeavor to track down the cause. Through the media of daily newspapers, radio, and television, Ontario Hydro tries to acquaint the public with these causes of fires of electrical origin, and the means by which they can be prevented. Safety advertisements are published from time to time.

Ontario Hydro wholesales power to 343 municipalities in the province for retail sale. These local commissions and utilities conduct public campaigns of their own in the urban centres, so that the impact is two-fold.

In the rural areas, the picture is somewhat different. Ontario Hydro retails power directly in these areas, and the safety educational program is complicated by the great distances to be covered. This can be seen when it is realized that, as of September 30, 1955, Ontario Hydro had 43,509 miles of rural line serving 411,117 customers, of whom 137,818 are farm services.

To reach these important customers with facts of electrical safety, Ontario Hydro participates in numerous farm and rural radio programs annually, and reaches local audiences through daily and weekly newspapers both in advertising and story. Hydro has a demonstration panel, which tours the rural areas, giving factual demonstrations of what occurs when electrical hazards are created. It also prints a semi-annual publication, "Rural Lines," that goes out to all farm customers in their billings, and contains many useful hints on safe practices. Members of the staff address school and adult organizations on the safe use of electricity, and locally, the offices serving Hydro's 105 Rural Operating Areas, located throughout the province, stand ready to assist any customer in adopting safe practices.

### Grounding On The Farm

Each year, our inspectors report electrocution of livestock on Ontario farms. Livestock has extreme sensitivity to electric shock. While de-



finite limits have not been established, our studies indicate that sustained voltages of 10 to 15 volts will prevent livestock from drinking, and it will experience mild shocks with sustained voltages of from 15 to 30 volts. It is considered sustained voltages of from 30 to 50 volts are hazardous, possibly fatal.

This is a serious matter to the farmer, where accidents to his livestock may represent the difference between profit and loss. Any correction of the situation will be beneficial to the agricultural economy. Such accidents, it seems from available statistics, tend to be due to sustained potentials resulting from ground faults in the wiring or equipment.

In urban districts, metallic public water systems provide an ideal low resistance ground electrode. These low resistance values are difficult to obtain in rural areas, due to the high resistivity of the soil, or the presence of sand and rock.

The customer's premises are grounded by using driven metallic ground rods as grounding electrodes. Thousands of tests have shown the resistance of these electrodes varies over wide limits.

Ontario Hydro recognizes the necessity of effective grounding of electrical installations and equipment in rural areas, to provide protection against electrical shock and fire hazards.

Other factors contributing to the electrocution of livestock:

(1) accelerated deterioration of wiring and equipment, due to condensation, and to corrosive fumes existing in many stables and milk-houses.

(2) failure to maintain equipment in proper condition.

(3) mechanical abuse and use of unapproved wiring materials.

(4) lightning surges of farm wiring systems, a major contributing factor in the general impairment of insulation.

Hazards from ground faults, due to the failure of the insulation of equipment, arise from the widespread use of metal stanchions in contact with piping systems, where these are, in turn, in contact with electrical equipment—milking-machines, water pumps, electric water heaters, soil-heating cable for frost protection, etc. In such a situation, cattle are in contact, possibly for long periods, with metallic structures. The latter may become energized by the failure of the insulation in electrical equipment.

Present grounding practice in rural areas is the bonding of metal enclosures of the wiring system and equipment, including driven ground electrodes and local water systems, to the secondary neutral conductor at the service entrance of each building (house or barn). Primary and secondary neutrals of the supply transformer are bonded together.

The disadvantage of this is the possible introduction of primary neutral fault potentials on the secondary system. If equipment grounds were isolated from the secondary neutral, secondary fault potentials would be sustained. When these potentials involve the stanchions, directly or indirectly, they are hazardous.

The necessity of some means of reducing to safe values the potential gradient between stanchions and gutter is apparent.

### Providing Protection

How can a substantial degree of protection be provided?

A few years ago, it was recommended to the farmer that metal stanchions be isolated from contact with all grounded metal structures. This was done by inserting rubber or plastic hose of various lengths and diameters in the water and milker pipe lines, adjacent to the stanchions.

Such insulating links:

(1) break the metallic continuity of the pipe;

(2) insert a high resistance in the fault current path to the stanchion.

Resistances of several hundred ohms in water lines have proven effective. Resistances of several thousand ohms are readily obtained, with reasonable lengths of link.

Recent study has led to the following conclusions:

(a) that almost complete protection against ground faults can be obtained by bonding all metal structures, and structures in contact therewith, to the secondary neutral (including metal stanchions);

(b) if the neutral has potential on it, all grounded metal parts rise and fall together, with the very desirable effect of reducing local gradients.

Adopting this practice results in such an improvement in grounding that primary neutral potentials do not present a serious hazard.

Local rural water systems are considered a liability. As such, they are required to be bonded to the neutral. This bonding must be made by means of a separate grounding conductor, connected to the secondary neutral in the service entrance equipment. This prevents the hazard, should circuit conductors be inadvertently interchanged, of placing sustained full secondary potential on the equipment enclosure. For the same reason, identification, by use of a bare conductor, for the neutral conductor in overhead rural yard wiring is compulsory.

This method permits the branch circuit overcurrent protective device to:

(1) operate promptly.

(2) clear the fault.

(3) prevent the hazard of sustained arcing grounds.

The fact that approximately 86 percent of the fatalities to dairy cattle have been due to secondary equipment failure makes the adoption

*(Continued on page 28)*





△  
OVER 175 delegates attended this year's Western Ontario Accounting and Office Administration Conference held at Hamilton.

# *Briefing on Budgets*

**Western Ontario utility accountants discuss financial forecasting at 23rd annual A.M.E.U. conference**

ONE of the most valuable contributions an accountant can make to the management team is to provide an easily understood story of the effect of past and future operations. Statistics, presented in a simple and informative manner, can achieve that objective.

This, in brief, was the opinion expressed by John Irvine, Secretary-Treasurer of the Etobicoke Hydro-

Electric Commission, in an address before the 23rd annual conference sponsored by the A.M.E.U. Western Ontario Division Accounting and Office Administration Committee.

The sessions, held in Hamilton on September 22 and 23, covered a wide variety of topics, ranging from accounting, advertising and budgets, to a panel discussion arranged by Ontario Hydro

regional accountants, and the showing of a film on public relations. Between sessions, delegates saw demonstrations of business equipment and, at the close of the conference, a large group toured the offices of the Hamilton Hydro-Electric System.

Posing the question "What do commissions and managers want from the accountant?" Mr. Irvine's paper was one of a number of in-



teresting and thought-provoking addresses given by well-informed speakers during the fast-moving, two-day meeting.

Stressing that the accountant's most important function is expressed by service to management, and reviewing his responsibilities from this angle, Mr. Irvine, in his address, said:

"I would suggest that the natural way for the accountant to make a contribution to the management team is to supply an easily understood story on the highlights of the previous year's operations and growth. This is chiefly a task of arranging the statistics, as recorded in our books, in a brief, simple and informative manner.

"For example, one page might offer a comparison of figures to show the growth over the previous year in such things as number of customers, revenue, total plant, station capacity, peak load and debenture debt. The growth, thus recorded, is often surprising as we are usually too close to the work to appreciate it."

### Revenue Statement

Mr. Irvine also recommended that another page should show a comparison of the revenue dollar—how the money is spent—such as could be found in some Ontario Hydro reports.

Discussing wage structures, Mr. Irvine pointed out that utility accountants should be sure that management has accurate figures on fringe benefits for employees. In utilities these may vary considerably. It is important that management is made aware of the fact that these benefits may have an important impact on the effective hourly rate.

Other aspects of Mr. Irvine's speech, which incidentally revealed an ever-growing range of fields in which accountants may serve management, concerned accident prevention, workmen's compensation, provision of accurate vehicle operating costs, insurance, stores control and budgets.

One of the speakers, H. K. Wilby, Personnel Manager of the Steel Company of Canada, discussing "How Our Business System Operates," pointed out that the competitive struggle for customers' business not only weeds out inefficient companies, but lowers prices and improves quality, and, indirectly, raises the standard of living among customers.

Dealing with the increased ratio of output, Mr. Wilby said each worker today is producing, on the average, some three to four times more than a man working back in 1881. This great increase in production is mainly due to the ability to develop and use more and better materials, equipment and tools on various jobs. The existence of any company depends on three groups of people:

—The Owners: For continued investment of money to provide the plants, the machines and the tools with which employees can work and produce;

—Employees: For cooperative work in the effective use of the plants, machines and tools provided by the owners;

—Customers: For taking the product of the employees' work made possible by the use of the owners' plants, machines and tools and sending back the money to pay for wages, materials and dividends.

### Advertising Discussed

In a complete change of subject, K. J. Farthing, Manager, Consumer Products Advertising, Canadian Westinghouse Company, as banquet

(Continued on page 20)



△ G. A. HONSBERGER, Assistant Comptroller, Ontario Hydro, discussed financial forecasts.



△ D. N. DURWARD, Manager-Secretary, Galt P.U.C., Chairman of this year's conference.

▷ JOHN IRVINE, Secretary-Treasurer, Etobicoke Hydro Commission, stressed service to management during his conference address.







◀ BETWEEN sessions delegates took the opportunity of watching demonstrations of business machines by sales representatives.

writing set until the Windsor Commission moved into its new offices next January.

During the second day of the conference, delegates were asked to present their problems to a panel discussion group comprising Grant Stickney, Stratford P.U.C., Herb Brennan, West Central Region, Hamilton; Miss Norma E. Crane, Niagara Falls H.E.C.; George Conn (Chairman) Niagara Region; Ed. Frantz, Niagara Region; Bert Caskey, St. Thomas P.U.C., and Harry Ellis, Western Region, London.

The panel discussed loss and damage to equipment, with both questions and answers coming from the floor, while the the subject of records retention resulted in the decision to ask Ontario Hydro's Records' Manager for advice concerning the length of time that utility records should be retained.

H. A. Luckins, Secretary-Treasurer of Sarnia H.E.C. and Chairman of the Conference Papers Committee, terminated the discussion in order to keep the program on schedule, but in view of the interest shown it was decided to allocate a half-day in next year's program for a similar panel.

#### Financial Forecasts

Continuing an instructive morning's proceedings, delegates turned their attention to a talk on "Budgets and Financial Forecasting" by Ontario Hydro's Assistant Comptroller G. A. Honsberger.

Discussing capital expenditures necessitated by rapid expansion of utility facilities to meet increased demands for electrical service, the speaker emphasized the importance of preparing forecasts of revenue as well as expenditures. Remarking that delegates would be in a better position to understand "Financial Forecasting" after reading a paper on this subject presented by Hydro's Assistant General Manager and

guest speaker discussed the "Fascinating Business of Advertising."

During his interesting and humorous talk, Mr. Farthing warned, from the vantage point of long experience, that there is no easier way of throwing money "out of the window" than by ill-considered advertising. He said advertisements should provide full information, and answer the potential buyer's unspoken ques-

tion: "What does the product do for me?"

Challenging the dictum that the world will beat a path to the door of the man who builds a better mousetrap, Mr. Farthing said "people will only buy better mousetraps if they know they are better and when they are offered at a price they can afford to pay."

A pleasant ceremony during the evening program was the presentation of a desk set to Jack Cook, Windsor Utilities Commission, to commemorate an association of 20 years with the A.M.E.U. Committee. Expressing his thanks, Mr. Cook said that although he had asked to be relieved of his duties as an officer of the Committee, he intended to retain his membership, adding he would not use the handsome



◀ ACTIVE on the conference committee for 20 years, Jack Cook, Windsor Utilities Commission (right), receives congratulations and a presentation from J. W. Hammond, General Mgr., Hamilton Hydro-Electric Commission.



Comptroller E. H. Banks at the technical conference of the A.M.-E.U. during the past summer, Mr. Honsberger said as municipalities developed, accountants would be called upon to supply vital information from their records.

### Primary Function

The primary function of budgeting Mr. Honsberger defined as charting the most profitable course for a business and aiding the business in keeping to that course. Specifically budget aims include:

1. Establishing a tool by which basic policies can be examined periodically and published as guideposts for the organization;

2. Correlating and co-ordinating the efforts of all departments. Management, through budgets, has an opportunity to obtain the services and thinking of their entire supervisory structure relative to operational plans;

3. Establishing feasible targets and examining the actual performance relative to those targets;

4. Directing or channelling capital expenditures. This is accomplished through two broad avenues: By analyses, which reveal problem areas and which suggest capital expenditures as possible remedial action. Establishment of limitations within which capital outlays must be confined.

Mr. Honsberger emphasized that accountants must observe the following rules in preparing effective budgets: make them accurate and easy to interpret; highlight significant facts and include all pertinent facts, such as the effect upon customers' relations through rates. The speaker also stressed making a systematic follow-up to ensure that costs are being controlled within budgetary limitations and that deviations are either explained or corrected.

Referring to the suggestion in Mr. Banks' paper that utilities should endeavor to prepare an annual forecast of expenditures for the ensuing two-year period, Mr. Honsberger

stated that the services of the Commission's municipal accountants would be available to the municipalities in the preparation of such forecasts. "We hope," he said, "to develop such a procedure on an effective and co-operative basis."

In a short luncheon address, Hydro Vice-Chairman W. Ross Strike, also referred to the subject of budgets, which, he said, are of vital importance, both for planning and financing the work in an orderly manner. Mr. Strike suggested that managers and accountants of larger utilities should work closely together to ensure a satisfactory financial position. Managers of smaller utilities should encourage their staffs

to prepare monthly financial statements. He also recommended that managers encourage their staffs to take an interest in the day-by-day administration of the utility by welcoming questions and explaining not only what is being done, but also the reasons.

David N. Durward, Manager-Secretary, Galt P.U.C. and Chairman of the Conference Committee, adjourning the conference, described it as one of the most successful ever held, with a well-above average attendance of 175 delegates. Mr. Durward also announced that next year's conference would be held at Windsor, September 20-21. — *B. Frank C. Wood.*



## ATOMS-FOR-PEACE CONFERENCE

**T**HREE prominent representatives of the British Atomic Authority met in Toronto recently with Dr. Richard L. Hearn, Ontario Hydro Chairman. The meeting followed a Canadian-British conference on the exchange of atoms-for-peace information at Chalk River, Ontario. Shown in the above photograph, left to right, are: Dr. J. V. Dunworth, W. L. Owen, Dr. Hearn and K. B. Ross.



# ALL EYES ON POTATOES

Shelburne's Dufferin Potato Growers' Co-Operative  
And Hydro Help Make Potato-Growing Profitable

By HORACE BROWN

AN interesting experiment in the co-operative marketing of potatoes has paid off for the members of the Dufferin Potato Growers' Co-Operative. Banded together, 80 farmers within a radius of 12 miles of Shelburne have shown, for more than 10 years, that potato-growing can still be profitable in Ontario. During the 1954-55 season, the "Co-Op" had its biggest year, marketing 75,000, seventy-five pound bags, under its famous "Hi-Land Potatoes" trademark, an increase of 33,000 bags over the previous year.

This reversed the general trend in the province, where acreage and yield of potatoes has fluctuated considerably in recent years. It is reported, in fact, that Ontario does not grow half enough potatoes for its own needs. In 1953, Ontario farmers had 63,000 potato acres under cultivation; last year, there were only 56,500 acres. The estimated yield for 1954 was 9,500,000 bushels, as compared with 11,725,000 bushels in the previous year. Ontario Department of Agriculture officials feel that the old days, when every farmer planted a half-acre to four acres of potatoes, are past, and

that the potato has become a crop for the agricultural specialist, with large growers predominating. They point out, however, that the opportunities in Ontario are excellent, provided growers "are prepared to do a good job of growing, grading and merchandising."

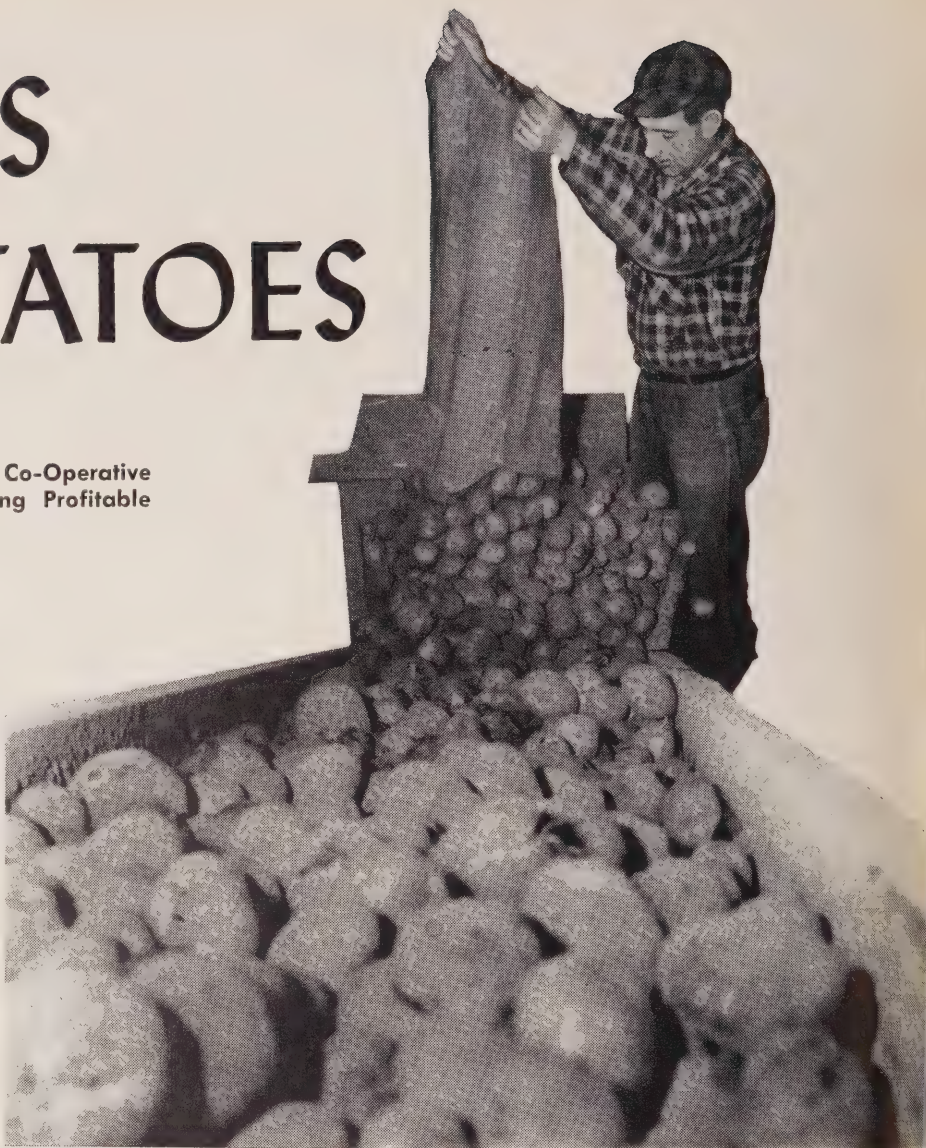
With the potato an important item on the Ontario table, the Dufferin Potato Growers' Co-Operative set out to make it possible for the

farmers of the Shelburne district to market their product economically through a common outlet. In 1944, 60 original members joined forces to found the project.

## All-Electric Operation

The result is a completely electrically - powered potato - grading, sorting and washing "assembly-line".

The co-operative aspect became a three-way affair between the Duf-



ELECTRICALLY-operated conveyors perform a number of essential operations at Shelburne's Potato "Co-op." Here the "spuds" are being dumped into a conveyor on their way to be washed, graded, sorted.

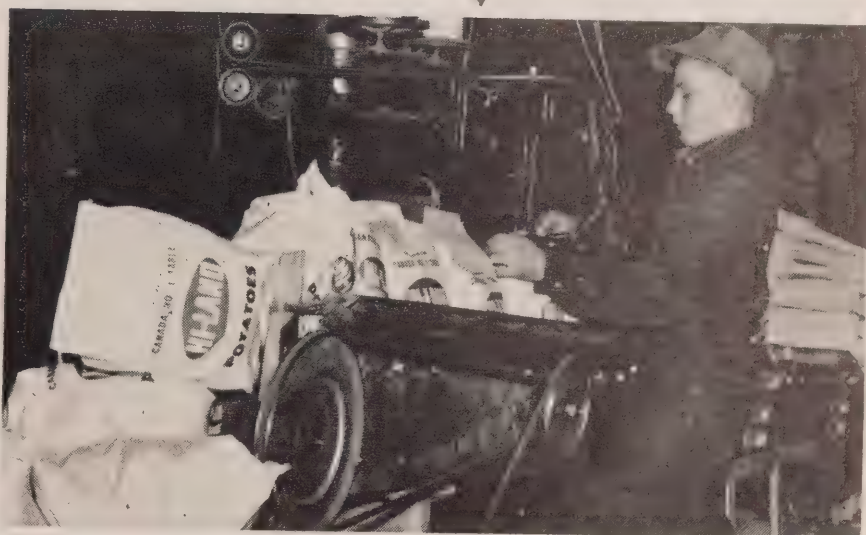


AFTER washing, the potatoes pass along the sorting and grading table where these employees keep a close watch for inferior grades.



ANOTHER electrified operation is the accurate filling and weighing of 10-lb. bags.

END of the line! A junior member of the staff deftly operates an electric "stitcher"



ferin Potato Growers, the supply of essential electricity by Ontario Hydro, and the Federal Government. The latter entered the picture when it carried out an experiment in the packaging and grading of potatoes. The "Co-Op" volunteered to take part in this experiment.

With room for storing 15,000 bags of potatoes in the cellar bins, which are ventilated electrically, the "spuds" are moved up to the "assembly line" on the main floor by electric conveyors. There they are washed, sorted by hand as they move along rollers, bagged, and the bags are sewn electrically. Besides its 75-pound bag output, the "Co-Op" finds the bulk of its sales in 10-pound bags, bearing its trademark, through a large Ontario grocery chain.

### \$25,000 Headquarters

The co-operative idea was so successful that the group, which had grown to 80 members, individually signed \$200 notes to finance a new building in 1949. This resulted in the present \$25,000 one-storey structure, 60 feet by 80 feet, with

a loading platform and railroad siding, and some nine to 14 employees, depending upon the season.

William Rutledge, Manager, of the Dufferin Potato Growers' Co-Operative is prepared to give the credit for the success of the experiment to electricity.

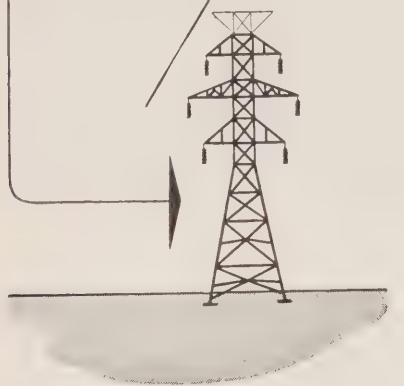
"We operate our complete assembly-line on a Hydro bill of about

\$34 a month," Mr. Rutledge said. "We just couldn't get along without Hydro. It's one of our most economical employees."

With Wilfred Newell as President, the 1954-55 executive includes Harold Webster, Clifford Faint, Lyall Campbell, Harold Wilson, Howard Ferris and Secretary-Treasurer Ralph Davison.



## ALONG HYDRO LINES



### Will Hold Vote On Hydro Purchase

London Township taxpayers will vote on the question of purchasing the local electrical system from Ontario Hydro during April or May next year. After a three-month study of the Commission's offer, township council has announced approval of the offer and will submit a bylaw to the ratepayers for their decision. A series of public meetings will be held for the purpose of explaining details of the proposed purchase and the bylaw in question.

### Fort William Power Consumption Up

Electrical consumption continues to mount in Fort William, according to figures released recently by Hydro Manager A. W. H. Taber. By the end of September this year, revenue of the Fort William Commission totalled \$891,117 as compared with \$852,913 for the same period last year. Energy consumption showed a corresponding increase totalling 109,491,000 kilowatthours in the first nine months this year over the figure of 103,592,000 kilowatthours last year.

## Niagara Region Manager Retires

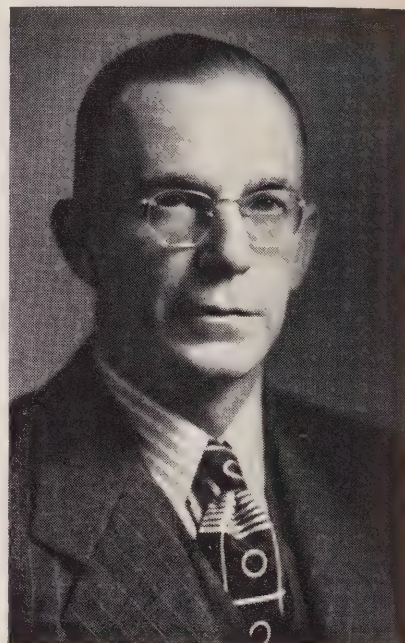
**AFTER** 41 years of distinguished service to the Commission, A. S. Robertson has retired from his position as Manager of the Ontario Hydro's Niagara Region.

Mr. Robertson, who will be engaged until the end of the year in a consultant capacity, has served as Manager since 1948. He has long been recognized as an authority on operations, generation and plant design, having held many responsible positions with the Commission since joining Hydro's Electrical Engineering Department in 1914, shortly after graduation from the University of Toronto.

One of his first assignments was the organization of a construction force to undertake the expansion program required to meet the increased power demands caused by World War I. Also during these years, Mr. Robertson was responsible for the installation of the electrical equipment of the London and Port Stanley railway and for the design and installation of electrical equipment for the operation of 10 electric furnaces at a munitions plant on Ashbridge's Bay, near Toronto, since dismantled. It was at this time that he became acquainted with the late Sir Adam Beck and many other Hydro pioneers.

A highlight of his Hydro career was his work in connection with the construction of the Queenston-Chippawa development, now known as the Sir Adam Beck-Niagara Generating Station No. 1, and at one time the largest hydro-electric plant in the world. Mr. Robertson was in charge of the design and construction of the stations required to supply power to operate the electric shovels and electric railway connected with the huge power station, and was also responsible for the installation of all electrical equipment at the plant.

In 1924, he was named Operating Superintendent of the plant. In 1938 his executive abilities were re-



A. S. ROBERTSON

cognized with his appointment as General Operating Superintendent of the Niagara District.

Mr. Robertson was appointed Manager of the Niagara Region in 1948 when Commission regional offices were established in nine strategic locations throughout Ontario.

In addition to his outstanding service with the Commission, Mr. Robertson has also been active in the field of public service. He has been a member of the Board of Governors of the Niagara Peninsula Sanatorium for over 15 years. It was during this period that a large addition was made to the hospital. Until recently, he was also a member of the Board of the Greater Niagara General Hospital, and has served as Chairman of the board of both institutions.

He is a Past President of the Niagara Falls Rotary Club, of which he has been a member for 26 years, and is also a member of the Association of Professional Engineers of Ontario and of the American Institute of Electrical Engineers.



## 10th City Standardized

Virtual completion of frequency changeover in St. Catharines brings to ten the number of cities in the Southern Ontario System, which have been standardized to date for operation at 60 cycles. The program in St. Catharines affected 12,950 domestic and commercial customers, for whom approximately 55,000 appliances (excluding clocks, fans and small items) were converted to 60-cycle operation.

Other former 25-cycle cities now operating at 60 cycles are Sarnia, Windsor, London, Stratford, Waterloo, Kitchener, Galt, Guelph and Niagara Falls. Changeover operations are currently proceeding in Hamilton and Toronto.

### WARREN P. BOLTON

Widely-known in Hydro and Ontario Municipal Electric Association circles, Warren P. Bolton died on November 9th after a brief illness.



W. P. Bolton

A member of the Windsor Utilities Commission for the past 13 years and chairman on several occasions, Mr. Bolton served on the executive of District 8 O.M.E.A. for some nine years, occupying the president's chair for two years. At the time of his death he was serving as a district director on the executive of the parent association and chairman of the Hydro Division of the Windsor Utilities Commission.

A noted sportsman, he was born at Hamilton in 1903, but had lived in Windsor for the past 45 years where he attended both public and high schools. Associated with Auto Specialties Ltd. as production manager, the deceased was a member of the Canadian Customs and Excise staff in Windsor for many years. Mr. Bolton leaves to mourn his loss, his wife and two children.



## WEDDING ANNIVERSARY

A FESTIVE note was added to the recent District No. 6 O.M.E.A. Convention at Goderich with the presentation of a bouquet of roses and a gift to Mr. and Mrs. E. A. Washburn, Stratford, on the occasion of their 15th wedding anniversary, which coincided with the date of the meeting. Mr. Washburn, General Manager and Secretary-Treasurer as well as genial Vice-President of the A.M.E.U., and Mrs. Washburn, are shown receiving the congratulations of A.M.E.U. President, H. A. Howard (right), who made the presentation. Beaming approval is Lt.-Col. A. A. Kennedy, Ontario Hydro Commissioner and President of the O.M.E.A., seated right foreground.

### Booklet On Capacitors Available to Utilities

A new 16-page booklet "Capacitors for Utility Systems" is available from the Canadian Westinghouse Company.

Arranged to provide maximum aid to users in selecting the best power capacitor for every application, the booklet matches various capacitor applications on transmission and distribution systems to the best capacitor unit for the job. These applications are presented graphically and discussed in detail.

The capacitor types discussed include: the stack-type for high voltage applications; metal-enclosed units for indoor and outdoor use; low-voltage units for secondary network vaults; automatically-switched

types for primary distribution circuits; pole-mounted types for unswitched applications on primary distribution; units for secondary distribution, and industrial units.

In addition, the design features of the universal interteem power capacitor that is used for all the various units is described and illustrated. For a copy of booklet B-6136, write Canadian Westinghouse Company, Hamilton, Ontario.

The first person to attempt the ride over Niagara Falls was a woman, Mrs. Anna Edson Taylor. In 1901 she made the drop in a barrel with an anvil for ballast, and survived.

—Quick Canadian Facts

# TERRAPIN TRANSFORMATION

U.S. Army Corps of Engineers Completes  
Its Share of Niagara Preservation Program



REMODELLED TERRAPIN POINT ON THE AMERICAN FLANK OF THE HORSESHOE FALLS.

WITHIN a few feet of Niagara's Horseshoe Falls, a brief ceremony took place on October 7 during which the Corps of Engineers, U.S. Army, Buffalo District, turned over remodelled Terrapin Point on Goat Island to the Niagara Frontier State Park Commission. The occasion, witnessed by some 100 people, marked the completion of the United States' portion of the Niagara Falls Preservation Program.

Addressing the gathering, Colonel Loren W. Olmstead, District Engineer, Corps of Engineers, paid tribute to Ontario Hydro engineers and their efficiency in handling the Canadian phase of the conservation and remedial works project, which is designed to preserve and enhance the beauty of the world-famous falls.

Mr. Joseph Davis, President of the Niagara Frontier State Park Commission, formally accepted Terrapin Point and expressed his appreciation to Col. Olmstead for the work done by his group. This work included extensive excavation on the American flank of the Horseshoe Falls to direct a greater volume

of water away from the eroding notch of the falls. At the same time, Terrapin Point was extended to give visitors a magnificent view of the river as it plunges over the crest of the cataract.

## Rapid Progress

Commenting on the progress being achieved by Ontario Hydro work forces on their portion of the remedial scheme, William L. Fraser, Hydro Niagara Project Manager, said that the Commission will complete similar excavations on the Canadian flank of the Falls early this winter. Meanwhile, work is being pushed rapidly forward on the Grass Island Pool control structure, which will extend 1,550 feet out into the swift-flowing stream.

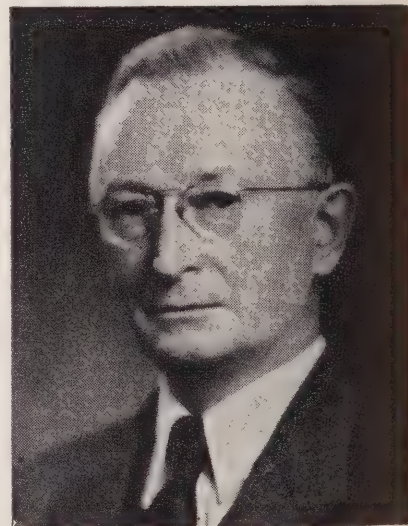
The joint Canadian-U.S. Niagara remedial project, scheduled for completion in 1957, is being carried out under the terms of the 1950 Niagara Diversion Treaty and will provide for a more even distribution of the river water over the crestline of the Horseshoe Falls and contribute to the most effective use of water for power production purposes.—By D. A. Heeney.

## Beautifying Substation Properties Approved

Property surrounding substation facilities in Canada's capital, the City of Ottawa is due for a face-lifting. At a recent meeting, Ottawa Hydro-Electric Commission approved a motion to improve and beautify its substation properties. The program will start at two of the city's main substations and will continue until all sites have been brought up to the desired level.

## Electric Club Announces Schedule

Niagara District Electric Club has announced its schedule of meetings for the 1955-1956 season. On December 14, Rev. A. L. MacKay, Hamilton will be guest speaker. An illustrated address, entitled "A European Odyssey" will be presented by Frank T. Groome, President, Holophane Company Ltd., Toronto on January 11, 1956.



DR. W. P. DOBSON

Formerly Ontario Hydro's Director of Research and a distinguished Canadian research engineer who has been named Chairman of the Administrative Board of the Canadian Standards Association Approvals Laboratory, Toronto. Dr. Dobson, who retired recently as the Commission's Research Consultant and Liaison Officer with Atomic Energy of Canada Limited (see Ontario Hydro News, October, 1955), has taken an active part in the increasingly important functions of the Canadian Standards Association for several years.



## **Pioneer Hydro Employee, Albert H. McBride, Dies**

The last survivor of the original seven employees of Ontario Hydro, Albert H. McBride, 73, passed away in October at his Strathallan Wood home in Toronto. Mr. McBride was the fourth engineer hired by Ontario Hydro, and wore the No. 1 button of the Ontario Hydro Quarter-Century Club. His six fellow-employees in 1906 at the second-storey Hydro office at Victoria and Adelaide Streets, Toronto, were: P. W. Sothman, H. G. Acres, Ed. Richards, W. G. Chase, Cecil B. Smith, and Victor Box.

A genial and kindly man, Mr. McBride left a deep impression upon the organization he served so faithfully and so well. He was an authority on early Hydro days and never tired of telling stories of the men with whom he was associated, most of his recollections being spiced with his own inimitable humor.

Born at 105 Bond Street, Toronto, a block from the residence of William Lyon Mackenzie, Mr. McBride worked in 1898 at the Bertram Engineering Works, then located at Niagara and Bathurst Streets. He was paid five cents an hour for a 55-hour week.

Under provisions made for mechanics, he entered the School of Practical Science, associated with the University of Toronto. In 1902, he took a teaching fellowship for the draughting class, and received his degree in engineering in 1904. After working on the second Welland Canal, he was hired by the original Hydro-Electric Power Commission to prepare the maps for the Commission's first six reports, and his initials may be seen on some of these.

In 1905, Mr. McBride plotted a survey for the Welland Ontario Power Company, which proposed a transmission line from Niagara to Dundas. When Hydro made its survey for this first long-distance power transmission line in the world in 1907, it followed the route Mr.



THE LATE A. H. MCBRIDE

McBride had laid down two years earlier. The deceased was also associated with the designing of facilities for the Commission's 110,000-volt transmission system.

From 1912 until his retirement, Mr. McBride was responsible for the annual allocation of costs among the co-operating municipalities. It was largely due to his high degree of integrity and fairness of judgment in the handling of the many and often contentious problems arising in this connection, that such harmonious relations were maintained between the municipalities and the Commission.

Retiring in 1949, Mr. McBride kept himself exceedingly busy, but he was never too occupied to see his old friends from Hydro. They came to the door of his pleasant home in large numbers, for his hospitality and wit were proverbial.

### **Stratford P.U.C. Approves Substation**

Stratford Public Utility Commission has approved the purchase of properties as a future site for a fifth Hydro substation and also a deep well for the water department. Tenders have been called for the building of a \$50,000 substation, scheduled for completion by the end of 1955. At a recent meeting, commissioners were informed that revenues in the electric department totalled \$464,204 to August 31st, 1955, with a surplus of \$81,393, while the retail department of the Hydro shop showed a surplus of \$1,376.

### **Former Mayor Named Utilities Commissioner**

Kincardine Town Council has named Joseph Chilvers, a former mayor of that municipality, to fill the vacancy in the Kincardine Public Utilities Commission caused by the death of Oran Westell. Mr. Chilvers term will expire at the end of the present year.

### **Western Ontario Group Meets At Leamington**

Held at Leamington, the recent fall meeting of the Western Ontario Electric Meter Association featured addresses by R. T. James, Sales Manager, Ferranti Electric Company, and by L. V. Hunt, Frequency Standardization Division, Ontario Hydro. Particularly helpful was the discussion period which followed Mr. Hunt's address on the repair of converted meters. Brief reports were also presented by Allan Lawson and S. T. Upper.

### **Phenomenal Trend (Continued from page 11)**

result from the increasing growth of load and number of customers.

### **Elect Officers**

Concluding the business session was the election of officers during which C. H. Moors, Fort William, was elected President for the ensuing year. Named to the executive for 1955-56 also were: Dr. Richard L. Hearn, Honorary President; Lt-Col. A. A. Kennedy, Honorary Vice-President; Dr. M. P. Bengert, Port Arthur, 1st Vice-President, and Reeve George O'Neill, Nipigon, 2nd Vice-President. Elected as directors were: Mrs. H. E. Hainsworth (Mayor), Sioux Lookout; Mayor J. R. Skillen, Dryden, and Eric Newman, Kenora. E. A. Vigars, Port Arthur, is Secretary-Treasurer this year.

With W. L. Wade, Nipigon, in charge of convention arrangements, delegates climaxed the convention with a bus trip to Hydro's Agassan Generating Station.—By The Editor.

## Fete Retiring Construction Engineer

Colleagues, representing Ontario Hydro as well as other organizations, paid tribute recently to the career and achievements of R. E. (Dan) McGrew on the eve of his retirement from the construction field. With a wide background of experience in the building of hydro-electric and large thermal stations, Mr. McGrew came to Toronto almost six years ago as Superintendent of Construction for Stone and Webster Engineering Corp., which handled the construction of Ontario Hydro's Richard L. Hearn Generating Station on the Queen City's waterfront. Although, officially representing the Commission's consulting engineers, the local staff, largely as a result of Mr. McGrew's organizational abilities, became, in fact, an efficient unit of the Hydro organization.

Designed to meet pressing demands for power, the station, under Mr. McGrew's energetic supervision, was brought into initial service on schedule in November, 1951. Mr. McGrew also had charge of the installation of two additional units authorized to meet increasing electrical demands.

Although due to retire, Mr. McGrew acceded to the Commission's request that he remain until the installation of the four units was completed. His plans for retirement were further delayed early in 1954 when mechanical failure in two of the units caused substantial damage to the station. Mr. McGrew again deferred to the Commission's request that he supervise rehabilitation of the plant which was completed a few weeks ago.

Recognition of his outstanding service to the Commission in completing construction of Canada's largest fuel-electric station was manifested by the presence of several Ontario Hydro officials, with whom he has been closely associated in the past few years, including Hydro Chairman Dr. Richard L. Hearn.

Representatives of Stone and Webster Corp. and C. A. Parsons

of Canada Ltd. and other organizations, which participated in the building of the 536,000-horsepower plant, also attended the complimentary dinner during which Mr. McGrew was presented with an illuminated scroll and a barometer, expressing the high esteem of his associates. ■

## Classified Ads

### FOR SALE

1 (only)—Commonwealth Electric Transformer: Serial 24499. 2000 KVA. 3. 25 Cycle. (50 deg. C.); Type O.I.S.C. — Volts 26400/-13200/575/2300-4000Y.; Total Weight: 40,000 lbs. filled with oil. (1485) gals.; Built 1947; Customer's No. 36; Imped. Volts 5.8%.

I (only)—Commonwealth Electric Transformer: Serial 35912. 3000 KVA. 3. 60 Cycle. (50 deg. C.); Type O.I.S.C. — Volts 27600/-13800. 2400/4160Y; Imped. Volts 5.36%; Total Weight: 30,300 lbs. with oil. (1150) gals.; Built 1950; Customer's No. V013273.

1 (only)—Bepco Transformer: Serial 13296. 2700/3350 KVA. 3. 60 Cycle. (55 deg. C.); Type O.I.S.C. — Volts 27600/13800. 2400/-4160Y; Imped. Volts; Total Weight 35,300 lbs. with oil. (1140) gals.; Built 1941 — Converted to 60 Cycle in 1951; Customer's No. 1941. Apply to: Mr. James Wickiam, Superintendent, East York Hydro Electric Commission, 175 Memorial Park Avenue, Toronto 6, Ontario.

### Power Guardians

(Continued from page 17)

tion of this system of protection attractive. In addition, it offers the maximum protection that can be provided by grounding against primary to secondary faults, and against lightning discharges.

### Summation

Naturally, with urban and rural systems as extensive as those of Ontario Hydro, I have been able to cover only a fraction of the causes

of electrical accidents and fires that come to our attention. They are in the main, typical.

Similarly, it has been possible to merely touch upon the means we advocate and use for their prevention.

It must be borne in mind that we are engaged in a never-ending struggle to keep always before our customers the need for safe electrical practices and for safe wiring. Our reward comes with the growing public realization that electricity, used wisely, is one of mankind's greatest benefactors, and, used unwisely, is a potential menace to life and property. ■

### Ahead Of Schedule

(Continued from page 4)

Commission's recent announcement (see *Ontario Hydro News* — July-August, 1955) that a fourth unit would be completed as part of the initial installation, with provision for the addition of a fifth unit when required. This means that Hydro's second English River plant, with four units completed by the summer of 1956, will have a dependable peak capacity of 75,300 horsepower (56,200 kilowatts).

### First Radio-Controlled Plant

Manitou Falls, in addition to the significant contribution it will make to the seemingly limitless expansion in this section of Ontario, will also enjoy the unique distinction of being the first Ontario Hydro generating plant to function as a radio-controlled installation. Operation of the station will be controlled from Ear Falls Generating Station — approximately 17 miles upstream — by means of supervisory equipment linked by a very high frequency radio communications system. Fully automatic, this new equipment will exercise direct but remote supervision over the new plant and will regulate the outflow of its power over a new 13-mile, 138,000-volt transmission line into Hydro's growing northwestern electrical network. —By The Editor.



# FOTO-NEWS



**SEAWAY TOUR** — Representatives of government, business and other organizations, including Ontario Hydro, recently had the opportunity of viewing progress associated with the St. Lawrence Seaway Development. Sponsored by The St. Lawrence Seaway Authority, the first in a series of tours took the visitors from Iroquois to Montreal, during which they inspected several important phases of the large international project. Travelling by bus, the party stopped at Cornwall where Gordon W. Mitchell, Director of Ontario Hydro's share of the international St. Lawrence Power Project, explained the work in progress at the site of the powerhouses being built by the Commission and the Power Authority of the State of New York. The accompanying photograph of this group was taken during the stop at Cornwall, and includes — Front row, left to right: J. A. Blay, Director of Information, and Mr. Mitchell, both Ontario Hydro; Hon. George Marler, Canadian Minister of Transport; Hon. Lionel Chevrier and C. W. West, President and member of The St. Lawrence Seaway Authority, respectively; Second row, left to right: L. J. Burpee, Deputy Chief Engineer, Gordon Murphy, Chief Engineer, and E. C. Shurly, Engineer of Construction, Seaway Authority.

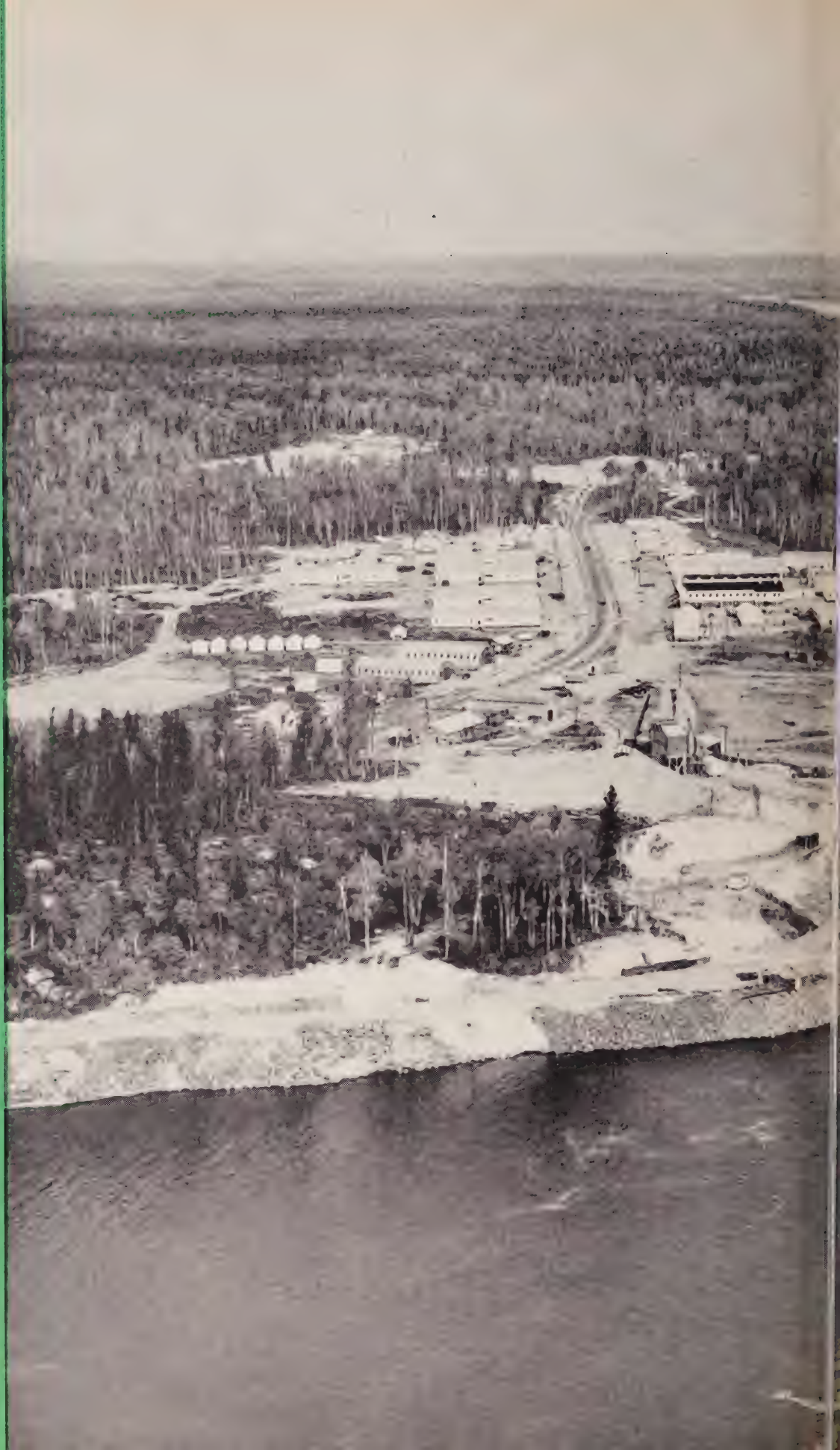


**CENTENNIAL CEREMONY** — Hydro colleagues of J. A. Williamson, Assistant to the Area Manager, Dundas R.O.A., Ontario Hydro, will be interested in his participation in the recent celebrations marking the centenary of the Royal Canadian Artillery at Hamilton. As Officer Commanding the historic 11th Battery a sub-unit of the 8th Field Regiment, R.C.A. — which also is celebrating its centennial this year, Captain Williamson laid a wreath during a memorial service at Hamilton's cenotaph. The 11th Battery perpetuates the Volunteer Militia Field Battery of Artillery, Hamilton, which was one of the original six batteries gazetted following passage of the Militia Act of 1855 by the United Parliament of Upper and Lower Canada. This group — Front row, left to right: Lt.-Col. H. A. Farthing, E.D., Commanding Officer, 8th Field Regiment; Captain Williamson; Brigadier P. A. S. Todd, C.B.E., D.S.O., E.D., C.D., Honorary Colonel, 8th Field Regiment; Second row, left to right: Col. A. J. B. Bailey, D.S.O., O.B.E., E.D., Director, Royal Canadian Artillery; Controller J. A. McDonald, representing the Mayor of Hamilton, and Major Eric Pincock, Central Ontario Area, comprised the official party of civic and military dignitaries who participated in the service.



# MANITOU IN THE MAKING

Scheduled for  
completion in 1956







DES JOACHIMS GENERATING STATION  
OTTAWA RIVER

ONTARIO HYDRO

D E C E M B E R

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## CHRISTMAS GREETINGS - 1955

*W*ITH the approach of Christmas, it is appropriate, perhaps, that we should pause for a moment to review the challenges and accomplishments of 1955.

From the moment that the bells ushered in the present year, we have been profoundly aware of the lessening of world tensions. We, too, have been privileged to witness, with rekindled optimism, the glowing spectacle of nations engaged in the pursuit of peace and in the friendly exchange of vital scientific and technical information designed to benefit mankind.

As we turn our eyes toward 1956, we are reminded that Hydro will be marking its 50th anniversary. It is with renewed pride that we recall the great contributions made in the past by those associated with this publicly-owned enterprise.

We humbly salute their memory and to those now working in this important field throughout the entire province, we send our sincere good wishes for Christmas and the New Year.



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## ROLLING BACK THE FRONTIER

AT THIS season it is, perhaps, a suitable time to make a rapid assessment of our progress in the past year.

While it would be premature and virtually impossible to present a full review of Hydro operations at this point, it is highly encouraging to realize that 1955 marked the completion of the initial, 900,000-kilowatt phase of the Commission's Sir Adam Beck-Niagara Generating Station No. 2. This mammoth development, with an ultimate installed capacity of 1,370,000-kilowatts, is the largest hydro-electric project ever completed by Ontario Hydro — larger even than the Commission's share of the total capacity of the St. Lawrence Power Project, which made highly satisfactory progress this year.

It is a source of considerable pride, too, that Ontario Hydro is the only Canadian electrical utility participating in the nation's present nuclear-electric program. During the year, it was announced that Ontario Hydro, Atomic Energy of Canada Limited and the Canadian General Electric Company would cooperate in the design and construction of a nuclear power demonstration plant at Des Joachim, Ontario.

Looking farther afield, it is gratifying to note also that the province's Bureau of Statistics and Research reported that the total of employed persons in Ontario at September 17—1,986,000—represented an increase of more than 60,000 over the same date last year.

Two recent events further symbolize Ontario's present expansion and her healthy economic position. On October 15, Pronto Uranium Mines, the province's first uranium producer, celebrated the commencement of operations. This company, with a modern, \$7 million plant and equipment capable of handling 1,500 tons of uranium ore a day, will be followed into production by three other major uranium mines. Together the four mines are expected to employ some 2,550 persons, who will live in new housing subdivisions at Blind River (see *Ontario Hydro News* — December, 1954) and in a model town at Elliott Lake, where the population may reach 20,000 in a few years.

A few days after the opening of the Pronto development, the Canadian Pacific Railway celebrated the completion of a new railway line to serve the thriving community of Manitowadge, which has been carved from the bush in the past few months to serve as the townsite for Geco Mines, a new base metal field, some 275 miles east of Port Arthur. The population of Manitowadge may eventually go as high as 6,000, according to the most reliable indications.

It is a source of considerable gratification for those associated with the province-wide Hydro enterprise to note the acknowledged role of the Commission in assisting and promoting this widespread growth. Speaking at the Manitowadge ceremony, N. R. Crump, President of the C.P.R., was quoted as saying: "We would not be rolling back the frontiers without the help of electricity."



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## Buy Christmas Seals



## Fight Tuberculosis

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CHRISTMAS APPETITES AND AN ABUNDANT  
SUPPLY OF ELECTRICITY COMBINE TO PRO-  
MOTE A THRIVING POULTRY ENTERPRISE



# LET'S TALK TURKEY



CHRISTMAS dinners still "on the hoof." At the Leaver Turkey Farm, Cooksville, Ont., the young turkeys are moved to 12 by 12-foot pens, complete with spacious, attached sunporches.

By HORACE BROWN

*"How bless'd, how envied, were our life,  
Could we but 'scape the poulterer's knife!  
But man, curs'd man, on turkey preys,  
And Christmas shortens all our days:  
Sometimes with oysters we combine,  
Sometimes assist the savory chine;  
From the low peasant to the lord,  
The turkey smokes on every board."  
—John Gay, "Fables: The Turkey and the Ant".*

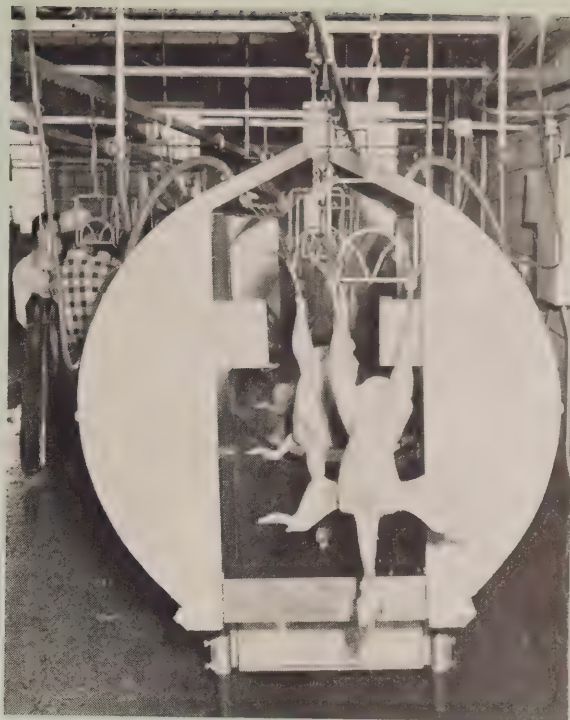
UNDER the soft glow of Christmas lights, the turkey gleams in the rich, dark brown of its oven dress. All eyes about the table are focussed upon the magnificent bird, beneath whose weight the Yuletide board creaks in pleasant protest. Some eyes twinkle with the knowledge of turkeys *Past*; young eyes are eager with the foretaste of turkeys *Present*, but, the bird itself has no particular interest in turkeys *Future*.

It is, too, a moment of triumph for the nominal lord of the manor. No longer is he simply someone who pays





DEMONSTRATING the numerous applications of electricity at a modern turkey farm, the man on the left is operating the electric "wing-stripper" — an important killing-plant machine.



STILL suspended from the overhead track, the plump birds are shown passing through the electrically-powered "washer" where they get a thorough cleaning before they are chilled.

the bills; he is a dispenser of largesse, an arbiter of destiny. Upon his slightest whim rests the dispensation of drumstick and wing. There are other portions to be carved as well, but these he will save for the days to come of cold collations when the memory of that glorious dinner begins to grow dim.

There is no doubt that the turkey and the Christmas dinner have become almost synonymous for many Canadians. When the taste of the bird is considered, its popularity as the palatable *pièce de résistance* of the Yuletide festivities is easy to analyze. What is more difficult to appreciate is the fact that turkey farmers go willingly into the business of rearing this "crazy, mixed-up kid" of the poultry business. The modern turkey is a silly, quarrelsome bird, susceptible to disease and hard to raise, partly because of its cannibalistic instincts. Yet Ontario farmers, last year, marketed 16 million lbs. of turkeys, valued at approximately \$8 million, and look to even greater production this year. The province's turkey population at June 1 (substantially reduced at Christmas and Thanksgiving) was estimated at 700,000 birds for 1955, as compared with 655,000 in 1954 and 568,000 in 1953.

Just as mixed up as the turkey itself, is the bird's history. Despite his name, he is not, nor apparently never was, a native of the land on the Bosphorus. In fact, the Turks refer to it as "that American bird."

The modern turkey is a far cry from his more intelligent and proud ancestor, the wild turkey, which once could be found in countless numbers in many parts of North America. He is larger, more heavily-breasted and his drumsticks have steadily gained in weight and importance. But he cannot compare in native ability with the bird that once graced the Pilgrim Fathers' tables.

The North American Indians enjoyed turkey drumsticks at least as far back as 1,000 A.D. It is generally accepted that the Conquistadores took turkeys back from Mexico to Spain early in the 16th century, thus introducing the bird to Europe.

This much we *do* know about the turkey: as a "brain" it may not have much "on the ball," but as a foodstuff it's supreme.

Electricity today plays a major role in the short life

(Continued on page 4)

of this bird. The ubiquitous kilowatt helps brood the poults, provides warmth and light, assists in the feeding and watering and gives ventilation. When the time comes for the turkey's demise, it is quite often an electric knife that is the painless executioner rather than the uncertain axe on the traditional chopping-block. In many modern turkey dressing-plants, it is an electrically-operated assembly line that defeathers the deceased, and prepares it for the electrically-cooled cold storage rooms where the turkey is kept in its snug wrapper until the marketing time arrives.

A fine example of the modern way to raise and market the turkey can be found at the Leaver Turkey Farm, Cooksville, Ontario, regarded as the largest turkey farm in the province, if not all Canada. In 1954, this farm "started" 26,000 Broad-Breasted Bronze turkeys and 23,000 of these were raised and marketed before the end of the year. The output this year has been increased to 61,500 birds.

The mere thought of some 120,000 drumsticks parading about 154,000 square feet of space is enough to make the mouth water expectantly. But, to achieve the finished product requires constant care and ingenuity with a liberal application of the salt of Science.

The Leaver ranch is located on 200 acres of good land in Peel County. Mixed farming is carried on, with particular attention to the growth of corn for the fattening of more than 100 steers during the winter months.

A 10-acre section is devoted to the buildings in which the turkeys are raised from poults. These buildings, set well back from the road, include a brooder house, turkey "porches," and the killing and refrigeration structures. The brooding house contains 40 pens, each of which can hold 200 poults. Each pen is lighted by two, 100-watt lamps, suspended 18 inches above the floor.

#### Brooder Porches

When the birds are four weeks old they are moved to the brooder porch. They remain here for a month in pens, each of which has its own sunporch. At eight

weeks, the poults go to the "growing" porch, consisting of six sections, 450 feet long and 200 feet wide in all.

The final stage for the now-grown birds is the holding room — a sort of turkey "death row," for the next step is to the electric knife.

The electrically-operated assembly-line at the Leaver Turkey Farm is a sight to behold. The bird is hooked to this line, killed, and the body descends from the floor above to the eviscerating floor, where the line carries it first through a scalding tank. A rough dresser, with rubber "fingers," busily removes the feathers from the body, while another machine strips the feathers off the wings.

Moving along the overhead track, the defeathered birds are cleaned by operators, each concerned with a particular job. Finally, they pass through the electrically-operated washer into large chilling tanks containing cold water and crushed ice. The birds remain in the chilling tanks from four to six hours, after which they are hung on racks in the electrically-cooled chilling room.

#### Vacuum Packing

One job remains, the vacuum-packing of the turkeys in plastic bags. Then they are individually-boxed, with the lids of the boxes left open, and frozen at 20 degrees below zero. The boxes are closed 24 hours later and the turkeys piled in the huge electric freezers, which can hold 32,000 boxed turkeys at temperatures generally hovering near the zero mark.

The Leaver Turkey Farm has branched into another aspect of the turkey business that is engaging the increasing attention of large producers. The farm maintains its own roadside market where fast-frozen turkey breasts and drumsticks, along with other turkey products, may be purchased.

Chief figures in this unique enterprise—outside of the turkeys, of course — are 93-year-old George Leaver, his son, Lloyd, and Kenneth Gartley, farm manager.

Naturally pleased with their rank as one of Canada's leading turkey farms, they modestly acknowledge the indispensable assistance of electricity in almost every phase of their operations. ■





# ONTARIO HYDRO SCHOLARSHIPS 1955

TEN students registered in engineering and technical courses are continuing their education at three Ontario universities and three other educational institutions with the assistance provided by the 1955 Ontario Hydro Scholarships.

Inaugurated in 1952, the Ontario Hydro Scholarships, with a total value this year of \$2,600, are presented as a tribute to the distinguished achievements of graduates in the engineering and technical professions and for the purpose of encouraging and assisting promising students in these fields.

For the first time this year, the Commission presented a \$300 award at the University of Western Ontario, London, where an engineering course was inaugurated in September, 1954. The Commission has approved two scholarships of \$300 each in the first and second years of this course. As only one year of this course was completed at the university, it was possible to make only the first-year award for the 1954-1955 term, with the two scholarships scheduled for consideration in subsequent years. This year's University of Western Ontario winner was:

*Ross L. Judd, 487 Baker St., London, Ontario (Electrical-Mechanical Engineering).*

Based on the final standings for the first, second and third year's work of students taking any engineering course related to the Commission's operations, three scholarships of \$300 each were awarded at Queen's University, Kingston and the University of Toronto.

This year's winners at Queen's University were:

*First year — Hugh R. Whitelev,*

*539 Broadview Avenue, Ottawa, Ontario (Civil Engineering);*

*Second year — Philip C. E. Clapp, 52 Perry Avenue, Lynnfield Centre, Mass., U.S.A. (Physics);*

*Third year — David A. Evans, Noxon Avenue, Wellington, Ontario (Mechanical Engineering).*

At the University of Toronto, the Hydro Scholarships were awarded

*First year — J. J. M. Huschilt, 33 Bayfield Avenue, Hamilton, Ontario (Electrical Engineering);*

*Second year — G. R. Sandwell, 219 Kensington N., Hamilton, Ontario (Engineering and Business);*

*Third year — D. M. McGregor, 3 Elmview Drive, Toronto, Ontario (Aeronautical Engineering).*

The \$100 scholarship presented to the most worthy cadet at the Royal Military College of Canada, Kingston, entering his fourth year of the electrical engineering course has been awarded to:

*Cadet W. J. Shewaga  
Revelstoke, B.C.*

At the Ryerson Institute of Technology, Toronto, where Ontario Hydro presents a \$100 scholarship in the second year of a three-year course in the Institute's School of Mechanical and Industrial Technology, the winner this year was:

*Neil M. Kemp, Atwood, Ontario*

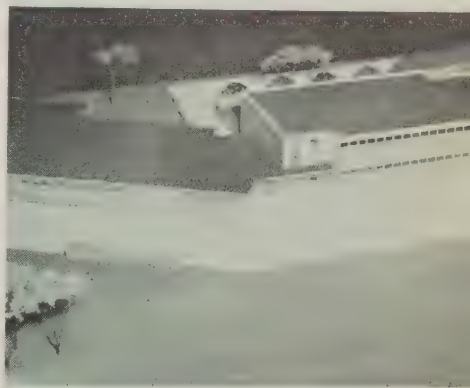
For the third successive year, a \$300 scholarship has been presented at Port Arthur's Lakehead Technical School in support of the training being given in the school's applied science course. The scholarship, awarded on the basis of academic standing and need, was presented to:

*Daniel M. Moziar, Jumbo Gardens P.O., Port Arthur, Ontario.*

(Continued on page 6)



ROYAL MILITARY COLLEGE  
OF CANADA—Kingston



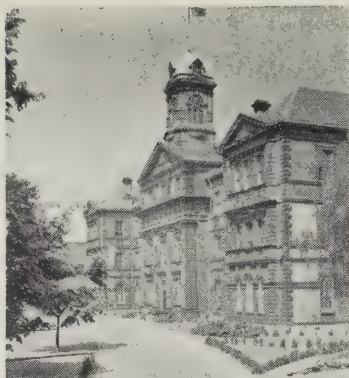
LAKEHEAD TECHNICAL INSTITUTE  
Port Arthur



UNIVERSITY OF TORONTO



UNIVERSITY OF WESTERN ONTARIO  
London



RYERSON INSTITUTE OF TECHNOLOGY  
Toronto



QUEEN'S UNIVERSITY  
Kingston

#### ROSS LEONARD JUDD



The honor of winning the first Commission scholarship awarded at the University of Western Ontario, London, fell to Ross Leonard Judd, son of Mr. and Mrs. Frank E. Judd, 487 Baker Street, London, Ontario. Educated at the Tecumseh Avenue Public School and the London South Collegiate Institute, he entered University of Western Ontario last year with a single subject scholarship for mathematics.

Associated with the 11th London "Rover" crew of Scouts, Mr. Judd also enjoys table tennis, hunting, and cabinet-making. A member of the first engineering class at Western, Mr. Judd has enrolled in the Electrical-Mechanical division of the course.

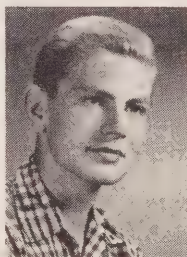
#### HUGH RUSSELL WHITELEY



Whiteley, was born at Ottawa on July

3, 1936. Obtaining his primary and secondary education at Broadview Avenue Public School and the Nepean High School in the capital city, he entered Queen's on a provincial entrance scholarship.

Describing basketball as his favorite sport, he has worked with an Ontario Department of Highways survey crew during the summer. The top man in first year, university authorities say Mr. Whiteley's record indicates the possibility of future distinction.



#### PHILIP C. E. CLAPP

Philip C. E. Clapp, who was awarded the second-year scholarship at Queen's, created interest among university officials last year when he sat for examinations in

an advanced year, without previous preparation, and obtained high standings. Specializing in physics, he was the winner of a University Scholarship and a prize in English at Queen's last year. This year, in addition to the Hydro scholarship, he won a prize in chemistry. The son of Dr. and Mrs. C. W. Clapp, 52 Perry Avenue, Lynnfield Centre, Mass., U.S.A., he was born in Kingston, Ont., on October 14, 1935, and attended public school at Albany, New York, and Scotia High

School, Scotia, N.Y. He is a member of the Key Club (Junior Kiwanis), his hobbies and sports including tennis, stamp collection, classical music, skiing and swimming. He was a member of the championship tennis team at high school. He has, in addition, found time to build scientific apparatus for his own use, including an expansion-type Wilson Cloud Chamber for viewing emissions from radioactive sources and a 3-inch refracting telescope.

#### DAVID ARTHUR EVANS



Winner of the Commission's third-year scholarship at Queen's this year, David Arthur Evans was born on September 24, 1931, at Medstead, Sas-

katchewan. A son of Mr. and Mrs. B. A. Evans, Noxon Avenue, Wellington, Ontario, he attended public and high schools at Spiritwood, Saskatchewan. Awarded a scholarship by the Toronto Branch of the General Alumni Association, he is a student member of the Engineering Institute of Canada and the American Society of Mechanical Engineers. He still finds time to engage in woodworking, fishing, sailing, curling and ice skating. He was a member of the Northern Saskatchewan High School Curling Championship team in 1948.



JACOB J. M. HUSCHILT



A keen athlete, Jacob J. M. Huschilt, born in Kitchener on July 15, 1933, the son of Mr. and Mrs. John Huschilt, 33 Bayfield Ave., Hamilton, has been

awarded the first-year Commission scholarship at the University of Toronto. Educated at the Holy Rosary primary and Cathedral High Schools in Hamilton, he gained honors with a percentage of 86 in his first year at university. A member of the Hamilton Senior Interscholastic Championship football team, he is interested in telescopes and cameras, tennis, softball, basketball and music. He has made a 24-inch telescope, the 3-inch objective lens of which he intends to use as a telephoto lens for a camera.

GERALD ROBERT SANDWELL



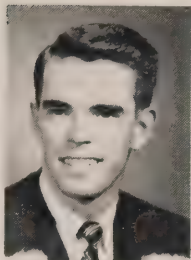
Winner of the second-year Hydro Scholarship at the University of Toronto, Gerald Robert Sandwell has also won the J. M. Empey Scholarship and the Hugh Gall

Award in previous years.

Born in Hamilton on May 5, 1932, he is the son of Mrs. Violet Sandwell, 219 Kensington Avenue North, Hamilton. Educated at the Memorial Public School and the Central Technical School, he is interested in such sports as tennis, badminton, swimming, basketball and bowling.

Standing first in the second year of the Engineering and Business course this year, this student worked as a member of Ontario Hydro's maintenance crew at the Gage Transformer Station in Hamilton during the past summer.

DOUGLAS MURRAY MCGREGOR

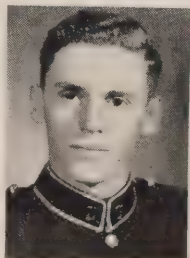


Mr. and Mrs. Arthur McGregor, 45 Miramar Crescent, Toronto. Born in Toronto on November 12, 1933, Mr. McGregor was educated at the Duke of Connaught Public School and the Danforth Technical School. He won several scholarships while attending Danforth "Tech." and the John M. Empey award in his second year at university.

While at Danforth "Tech." Mr. McGregor also was a member of four championship baseball teams, as well as one basketball team, which reached the semi-finals. He also edited the school magazine, the "Tech Tatler" and was Danforth's representative on Eaton's Junior Executive. His present affiliations include memberships in the Beta Theta Pi fraternity, Engineering Society Executive and the Presidency of the Aeronautical Club.

Mr. McGregor, in third year aeronautical engineering, gained first standing and honors with a percentage of 88 in the 1955 examinations.

CADET W. J. SHEWAGA

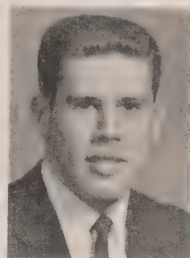


William J. Shewaga, winner of the \$100 Commission scholarship awarded to the most worthy cadet entering his fourth year of the electrical engineering course at the Royal Military College of Canada, Kingston, is the son of Mr. and Mrs. John Shewaga, Revelstoke, B.C.

Born at Revelstoke on February 8, 1935, he received his primary and

secondary education at the Selkirk and Revelstoke schools. Cadet Shewaga is a member of the R.M.C. Drama Club and is interested in music. As hobbies, he builds model aircraft and radio sets, while listening swimming and softball as his favorite sports. Following graduation, Cadet Shewaga plans to serve with the Royal Canadian Air Force for three years and then to become an engineer in civilian life.

NEIL MCBRIDE KEMP



Studying metallurgy at the Ryerson Institute of Technology, Toronto, Neil McBride Kemp, son of Mr. and Mrs. James M. Kemp, Atwood, Ontario, has

been awarded the Hydro scholarship at that school this year. Born in Toronto on January 20, 1934, he was educated at Atwood Public School and the Listowel District High School. He obtained the American Society for Metals Scholarship in 1954.

A member of the American Society for Metals and the Y.M.C.A., Mr. Kemp is interested in stamp collecting, football, hockey and softball. He was a member of the high school championship W.O.S.S.A. senior "B" football team in 1951. He played football for Ryerson in 1954 and was a member of the "Ryerson Rams" hockey team, 1954-55 winners of the C.O.H.A. title.

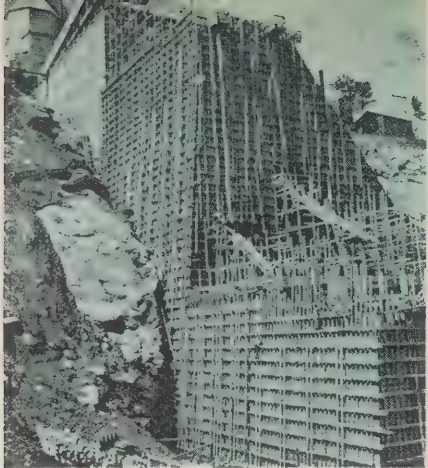
DANIEL M. MOZIAR



Winner of the 1955 Commission scholarship at the Lakehead Technical Institute, Port Arthur, Daniel M. Moziar, Jumbo Gardens P.O., Port Arthur, has shown consistently successful pro-

(Continued on page 25)





# PATHWAYS

Chapter V — Part II

By H. J. Barrett and V. A. Harvey\*

## CONSTRUCTION OF A DEVELOPMENT

AERIAL view of the Otto Holden G.S. development, showing the river passing through the diversion channel and temporary diversion sluices in the main dam (right), while construction of the main dam and powerhouse proceeds in the unwatered section on the left.





# TO POWER

IN THE previous article, the work involved in establishing access to the site, preparing camp facilities, building construction plant installations, and constructing cofferdam and diversion structures was described. In this article, an attempt will be made to describe, in general terms, the remaining aspects of the construction of a typical power development.

In the case of most hydro-electric projects, the building of cofferdams and the diversion of the river (as described in Part I) are necessary preliminaries to the actual construction of the main dam and powerhouse. With these phases completed, the area behind the cofferdams is pumped out to expose the natural river bottom. This operation may require from a few hours to a matter of days, depending on the tightness of the cofferdam and the condition of the underlying rock or earth.

With the area unwatered, the next operation is to remove the earth overburden or boulders to reach bedrock. This is usually done with diesel-powered shovels or draglines. If the overburden is very shallow, bulldozers are used. Earth and rock excavation are important aspects of power development construction. In addition to the rock excavation required for the powerhouse and dam, excavation for tailrace channels, intake canals, diversion canals and

channel improvements is necessary for most developments. In the past 10 years, starting with the Stewartville project on the Madawaska River, Hydro's Construction Division has excavated approximately 11 million cubic yards of material. Of this amount, approximately six

million cubic yards has been rock.

Normally three types of rock excavation present themselves in a power development. The first type of rock excavation is for diversion channels, tailrace channels and intake canals, involving excavation to

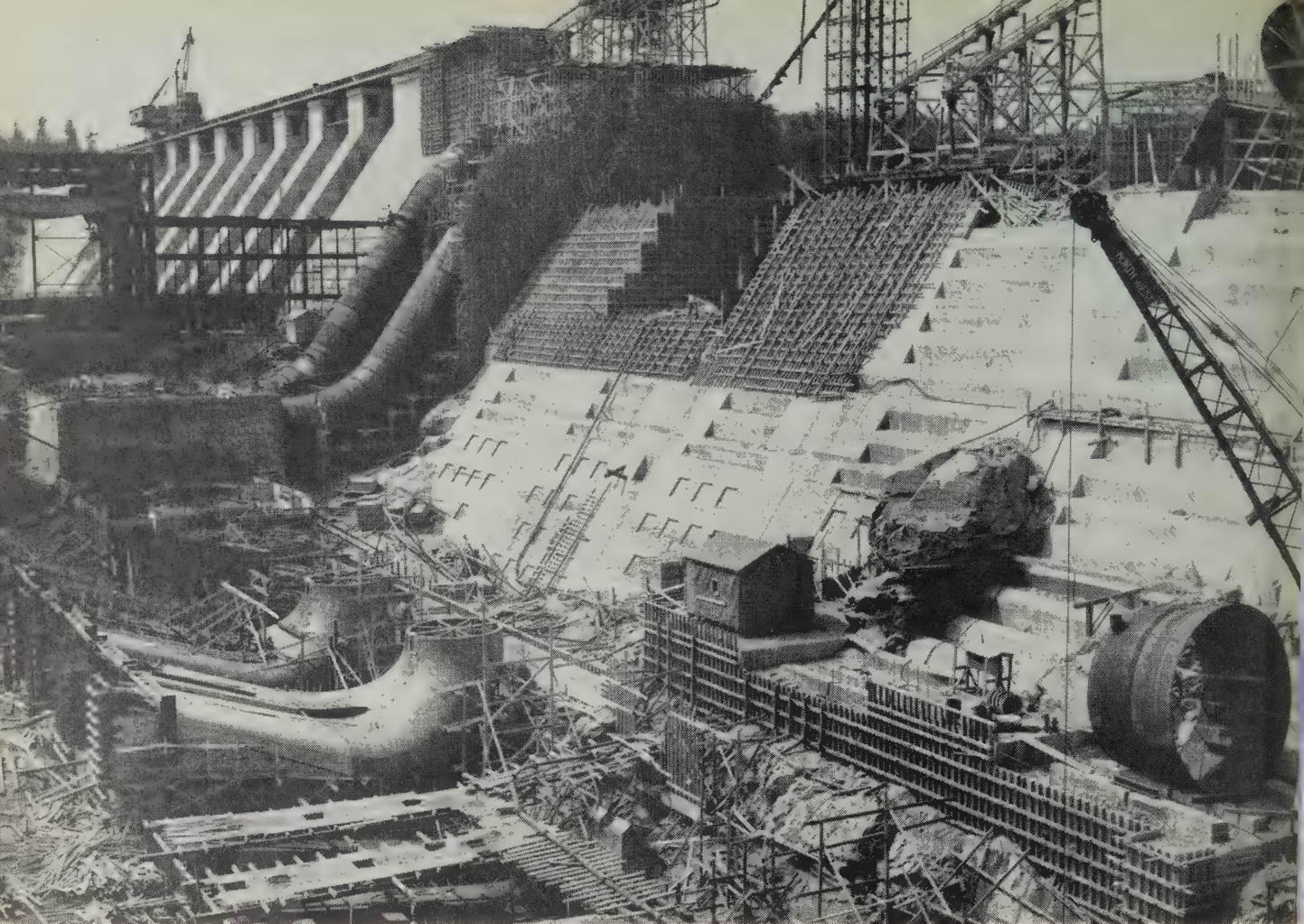
*(Continued on page 10)*

"CLOSE-UP" view of the same development, with the overhead concrete conveyor system (centre), and a section of the main dam (extreme left). The dragline and men (foreground), are clearing up after rock excavation for the foundations of the powerhouse.



WAGON DRILLS (top left), are drilling prior to blasting operations in the tailrace section. Loose rock from a previous blast (foreground), is being loaded into two diesel-operated trucks by the power shovel.





VIEW of Ontario Hydro's Des Joachims development with several phases of construction in progress. Formwork for two draft tubes is visible in the left foreground while steel girders of the powerhouse superstructure are being erected (left background). Two of the plant's steel penstocks and formwork for the placing of main dam concrete are also shown.

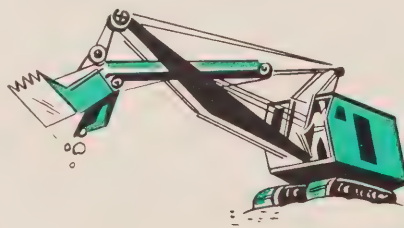
fixed dimensions and grades dictated by hydraulic design. The second type is dam foundation excavation to clear away the decomposed and fractured rock (usually found at the surface) down to a point where sound rock is encountered. The third type is powerhouse substructure and penstock excavation, which combines types one and two, because it requires following accurate measurements as well as getting down to sound, solid rock.

Blasting techniques vary considerably on the above types of excavation. Considerably more drilling must be carried out before blasting for powerhouse foundations to define

the shape of the excavation. Smaller individual charges of powder must be used to prevent shattering of the adjacent rock faces.

### Concreting Operations

When rock excavations are completed, the concreting of the various structures can proceed in full swing.



During rock excavation in the unwatered area, concreting can very often be commenced on the "shore" sections of the structures.

There are four main divisions of the overall structure, namely: main dam, spillways, headworks and powerhouse. Each of these has concrete as its principal construction material, but each requires different treatment and construction techniques. The main dam section is usually built in monoliths 30-40 feet wide and in lifts of 30-40 feet high. Alternate monoliths are poured and then the intervening sections are brought up. This involves large amounts of concrete poured into



simple, but strong formwork, with little or no reinforcing steel to interfere with the placing of the concrete. This concrete can be placed by conveyors, cableways, pumpcrete or bucket, the main problem being the relatively large amounts required and the relatively fast rate of pour required to keep the concrete "fresh."

The concrete in spillway sections is called "reinforced concrete" as opposed to "mass concrete" in the dam above. The spillway piers are relatively thin and are heavily reinforced with steel to take the force of the water. Due to the thin section and heavy steel, concrete must be poured more slowly and smaller aggregate must be used to allow the concrete to completely surround the reinforcing steel.

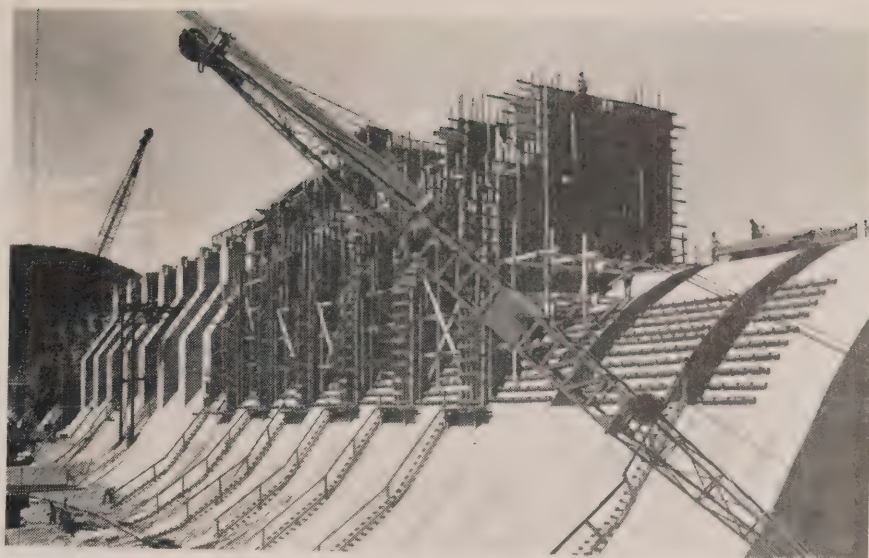
Headworks concrete resembles that used in spillway structures with perhaps the addition of more reinforcing steel.

Either wood or steel, or a combination of both, may be used in building formwork for concrete. There is a growing tendency to use more prefabricated steel formwork. Although this type has a higher initial cost, it can be re-used many times with a small erection crew. In the powerhouse substructure, the formwork for the various water passages, such as draft tubes and scroll cases, is quite elaborate. Due to the tremendous water pressures involved, closely-meshed reinforcing steel is necessary, presenting a challenge to the concrete crew in placing the concrete so that a homogeneous mass results.

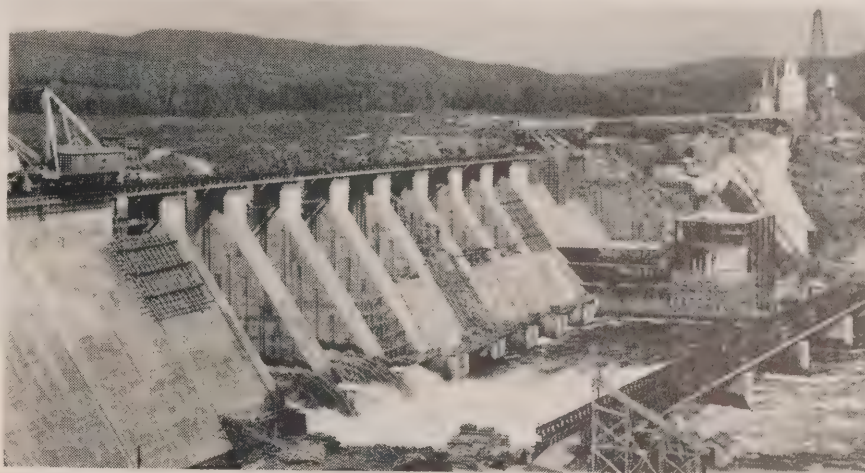
### Flooding Sequence

As concreting proceeds on the various structures, the dam virtually grows from the rock until the final elevation is reached. While turbine erection and generator erection are under way in the powerhouse, preparations are made to close the diversion gates and flood the headpond.

A typical sequence would be as follows:—



EITHER wood or steel is used in the construction of formwork for concreting operations. Concrete in the spillway piers is reinforced with steel to withstand water pressure.



DIVERSION sluices in the main dam of Hydro's Des Joachims Generating Station are being filled with concrete during the "two-stage" closure sequence followed at this development.

*First* — the diversion sluice gates are closed. This backs up the water in the headpond until the level of the lowest spillway is reached. The river is allowed to pass through the spillways and the diversion sluices are filled with concrete. The gates are then removed and installed in the main spillways.

*Secondly* — the gates are lowered in the main spillways backing up the river to the design headpond level.

This would be the situation in a "two-stage" closure. Closure can be effected in one stage, at a small development, or a multi-stage closure method, such as was used at the Des Joachims development on the Ottawa River, may be followed (see *Ontario Hydro News*, October, 1949).

At the same time, turbine and generator erection are proceeding in  
(Continued on page 12)



the powerhouse. The various pieces of the turbine, such as the speed ring, pit-liner, etc., must be very accurately aligned and levelled before they are concreted into place. Adding to the complexity of the operation, drainage and water-supply pipes, as well as conduits for lighting and control cables, must be embedded in the concrete.

The erection of the powerhouse superstructure steel and the overhead crane is accomplished by means of long, boom derricks or caterpillar-mounted cranes. Occasionally the steel may be erected by means of a travelling derrick mounted on the roof of a finished bay. With the steel completed, the walls and roof are built to the architect's specification. These details vary from a simple aluminum-sheathed wall to reinforced concrete with a pattern formed on the exterior surface by sand blasted from panels. In the former case, the aluminum panels are usually erected by the supplier in a minimum of time. When the latter

design is followed, a large crew of carpenters, steel men and concrete men are employed for many weeks forming and pouring the concrete walls.

As soon as the building is sufficiently weatherproof, the assembly and installation of the moveable parts of the turbines are undertaken. With the assistance of the travelling crane, the lower guide vane ring is placed in position. This ring contains the bottom bearings for the shafts of the moveable guide vanes. Then the vanes themselves are lowered into position. These operations are followed by the placing of the runner and shaft of the turbine. The shaft must be carefully centred so that it may be accurately connected up with the shaft of the generator. Then the watertight head cover, containing the upper bearings of the moveable guide vanes, is placed. The installation of the governor and of the mechanism operating the guide vanes follow.

When the work of erecting the turbine has advanced to an appropriate stage, the erection of the generator is started.

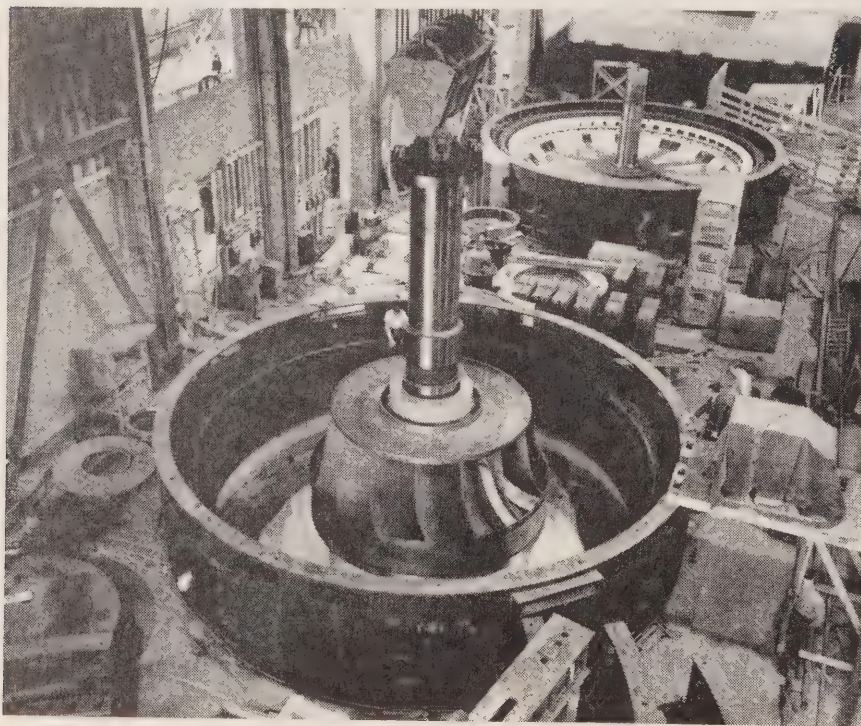
The generator consists of three parts—the stator or stationary section, the rotor or moving part and the upper and lower brackets to support the shaft and its bearings. The lower bearing is merely a guide bearing, but the upper one is both a guide and a thrust bearing. It carries the total weight of the turbine runner and the generator rotor with their shafts, as well as the water passing through the turbine.

The generator is usually erected by the manufacturer who moves a crew to the job to assemble the multitude of components. The stator coils are stacked in position and the rotor coils are stacked on the rotor, which is usually set in the erection bay at one end of the powerhouse. The position of the bearings is fixed very accurately before the rotor is placed. When the rotor is placed, the upper bracket and bearing are set in position and the turbine and generator shafts are coupled together.

Meanwhile, the electrical phases of construction have been proceeding. Transformers have been installed, switchgear hooked up and the control cables have been connected to the switchboard in the control room of the powerhouse.

Outside the powerhouse, a switchyard has been erected and the transmission line is ready to receive power. All that remains is for the chemical and electrical equipment to have its final testing before being placed in service. By this time, all essential construction work on the development will have been completed. Cofferdams are removed and clean-up of the site is in progress.

As soon as the "mechanical and electrical runs" have taken place and auxiliary equipment has been checked, another hydro-electric development is ready to produce power. ■



△

TURBINE and generator erection under way in the powerhouse. With the generator stator in place (foreground), the turbine runner and shaft of one of the units is lowered into position.



# CANADA'S *Sun Parlor*

Once a modest lumbering community, modern-day Leamington, a thriving Hydro municipality, is the centre of a major agricultural enterprise

By GORDON MURPHY

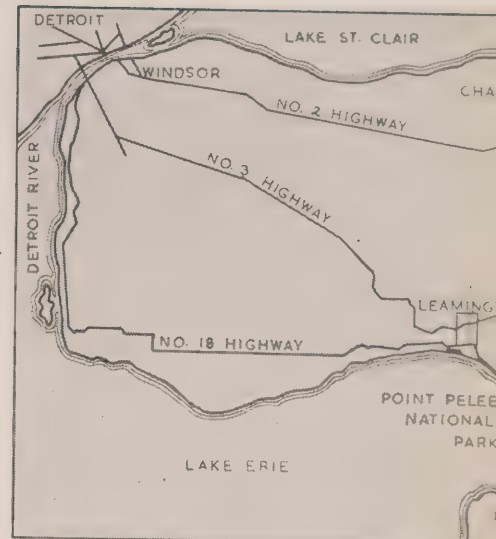
**E**VEN the most confirmed skeptic would have little hesitation in taking a substantial wager that there isn't a housewife in Canada who, at some time or other, has not purchased an item of food grown or processed in the vicinity of Leamington, Ontario.

Once the site of modest lumbering operations, Leamington today is the hub of one of Canada's most productive agricultural areas. This prosperous enterprise is attributed to a combination of several favorable factors. Regarded as Canada's most southerly town, Leamington, as the centre of some 140 miles of rich, sandy soil in Essex County, lies in the same latitude as northern California. With an average crop season of some 216 days a year and moist winds from nearby Lake Erie, the district possesses natural advantages for the annual production of some 60,000 tons of fresh fruit, flowers and vegetables — 33 different crops in all — which are shipped to the eager markets of Canada.

Flourishing under the self-imposed title of "The Sun Parlor of Canada," the district is ideal for growing such varied crops as tomatoes, tobacco, soybeans, cucumbers, lettuce, celery, corn and potatoes. Sweet potatoes are another popular commodity with local growers, large quantities being processed annually by a local firm, Pyramid Cannery Ltd. Marshland reclaimed from

LEAMINGTON, hub of a thickly-populated area, is situated on the north shore of Lake Erie, about 30 miles southeast of the busy City of Windsor.

FROM a small frame building, which housed the original Leamington kitchens in 1909, the H. J. Heinz Company has expanded until the local factory covers more than 31 acres and is regarded as one of the largest tomato-processing plants in the world.

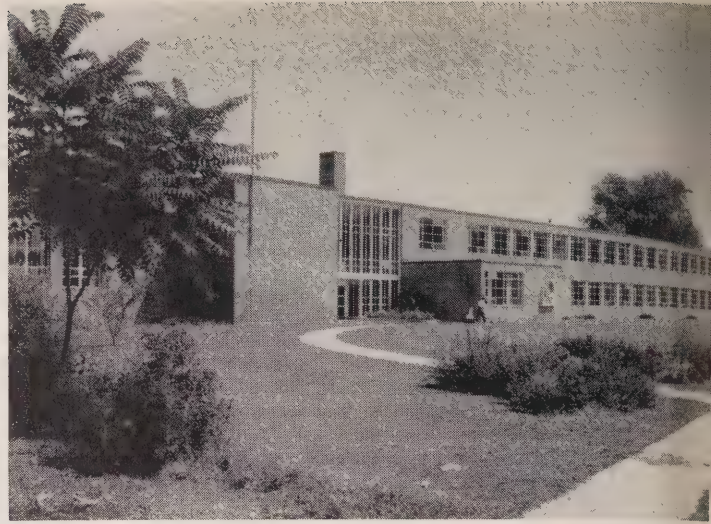


(Continued on page 14)





THOUSANDS of tourists flock to the Leamington district every year. This is a view of one of the town's main thoroughfares.



LEAMINGTON is also an important educational centre. The recently-completed high school accommodates pupils from a wide area.

Lake Erie several years ago and now protected by Holland-type dykes—some of them 20 feet high—yields prodigious quantities of onions.

To achieve such a high level of agricultural production, Essex County farmers have one of the highest per acre investments in machinery, land and buildings of any farmers on the continent. The fertility of the soil, combined with an ideal climate, gives farmers in the Leamington district a two-week edge on others in Eastern Canada in shipping early vegetables and fruits into the markets of Ontario, Quebec and the other provinces. Local growers will tell you that the cash crop from fruit and vegetables alone exceed, in value, the entire fruit and vegetable crops of Nova Scotia and British Columbia combined.

Growers have an investment of some \$15,000,000 in greenhouses alone, on land which ranges in value from \$350 to \$2,000 an acre. Greenhouses cover approximately 125 acres of ground in the area and it is in these "gardens under glass" that electricity makes an important contribution to Leamington's economy. Almost all of the many and varied operations of the greenhouse are performed with the

similar to those used in a well-run help of electricity, from soil-heating for young plants to cold storage. Ventilation, too, is electrically controlled, as is the temperature in most of the greenhouses.

Another large electrical customer is Leamington's major industry, the H. J. Heinz Company of Canada Ltd. Strategically located in the centre of this fertile area, the company first began operations during 1909, in an old building purchased from a now-defunct tobacco company. Today the company employs as many as 2,000 workers at the height of the processing season, with approximately 1,100 year-round workers. Many farmers in the area put crops under contract to the company and work closely with Heinz agricultural experts to ensure uniform high quality of produce.

#### Electricity's Major Role

At harvest time, farmers pack fruit and vegetables into scientifically designed baskets for government and quality control inspection, which takes place before the produce moves into the factory. Once inside, each vegetable is washed, peeled, trimmed or sliced, where required, and prepared for cooking, which proceeds, except for the tremendous

scale of the operation, along lines household.

As in the average household, too, electricity plays a major role from the time the fruit and vegetables leave the farmers' trucks. Electrically-operated conveyor belts carry the produce into the interior of the huge plant. From there on, save for the necessary hand inspection and trimming, electricity does the work; washing, cooking and even the labelling.

Electricity was first introduced to Leamington on November 1, 1888, the event being hailed by the *Leamington Post* as a great step forward in the growth and progress of the community. That the *Post* was right is reflected by the fact that the town's population has since grown 25-fold and the economy of the district has improved correspondingly since the turn of the century.

Like many other communities in Ontario—in fact, most—Leamington's growth and progress, particularly over the last 30 years, has been paced by the growth and development of its electrical system. The history of electricity in Leamington, from the opening of the original electric light plant in 1888, has been





◁ INSPECTOR examines baskets of fruit as they are loaded into a huge Erie Produce Co. van at Leamington for shipment to market.

"GARDENS under glass" around Leamington, in which electricity plays a key role, represent an investment of some \$15,000,000.



the story of the expansion of a very small operation to one which, in 1954, served 2,742 customers, using a total of 17,267,412 kilowatthours.

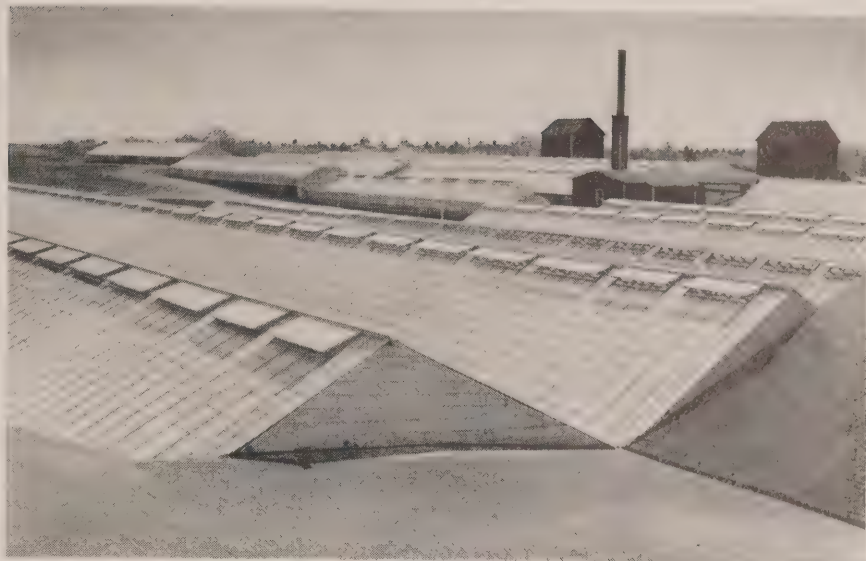
The owners of the first electric plant installed it in a saw mill owned by J. E. Snyder. Next year, it was moved to a building owned by one of the town's leading citizens, Lewis Wigle, a gentleman who did as much for Leamington as any man could for his home town. He was a member of the county council when the bill to incorporate Leamington as a village was passed. He was a member of the Ontario Legislature a few years later when the private bill to make Leamington a town was passed. Altogether, Mr. Wigle was in public life for 53 years, and it is due, largely, to men of his vision and faith that Leamington is the thriving centre it is today.

In 1899, a new charter was secured for the original plant under the name of the Leamington Light and Heat Company and the new firm was housed in a building on Princess Street.

Local plant owners sold out to Detroit interests in 1908 and five years later the Detroit Edison Company secured control of the system as the Essex County Light and Power Company. This firm started construction of a line across the county from Sandwich, to serve Amherstburg, Harrow and Kingsville. In 1914, another line to Walkerville was opened.

#### Local System Acquired

Ontario Hydro entered the picture in 1918 by purchasing the en-



tire Essex County power system. Leamington took over the local utility on November 1, 1923, under the Fire, Light and Water Committee of the council, with Rodell Smith as Chairman. This last transaction, incidentally, established something of a record as it is believed to be the only time that Ontario Hydro has sold a local system, purchased from a private company, to a municipality.

Now operating from a handsome, headquarters building completed in 1947, the presently constituted five-member Leamington Public Utilities Commission, established January 1, 1951, with a total staff of 17, administers the community's water and Hydro services under the chairmanship of Lawrence Graham. The total electrical load is virtually 13 times greater than it was 30 years ago, with a substantial percentage of it being consumed by the town's 59 power customers as well as 2,289 domestic and 394 commercial users.

Particularly noteworthy is the story of electrical frequency in Leamington. In 1888, lights in the homes of the first electrical customers operated at 133 cycles. When Detroit Edison acquired the local system in 1913, it was converted to operate at 60 cycles. Another change followed in 1918 when Leamington joined Ontario Hydro's 25-cycle Niagara System. Early in 1954, this busy municipality returned to 60 cycle power as part of the Commission's general frequency standardization program in the 25-cycle "island" of its Southern Ontario System.

A striking parallel exists between the expansion of the town's electrical distribution facilities, as well as other public services, and its economic growth. Leamington has come a long way since those not too distant days when the community was but a crossroads village of 300 people. Since then the community has gone

(Continued on page 16)



through a series of economic cycles, which began when early settlers established a thriving timber and lumber enterprise, and barrel staves and railway ties were shipped from the Leamington docks. With the disappearance of the forests, came the discovery of natural gas in the district. Soon derricks were silhouetted against the sky. Next came the peach-growing era, but uncommonly early frosts in the year 1900 all but put a halt to this industry, killing so many trees that it took the peach industry 20 years to recover from the blow.

Tobacco succeeded peaches as the area's principal commercial crop. Farmland, which had been worth as little as \$6.00 an acre spiralled in price to as much as \$1,000 an acre. Land, which had nourished peach orchards, became dotted with tobacco kilns. The soil that cradled the Canadian tobacco industry soon went back into peaches and other fruits and vegetables, however, and became even more valuable.

### Interesting History

Socially, as well as economically, Leamington has an interesting background. Records show that the town was named some 120 years ago by English settlers, who came to the area from Leamington Spa, England. The two towns have many unique associations. During the war, citizens of Leamington, Ontario, bought a mechanized hospital unit and sent it to their English cousins. In return, a stained-glass window, bearing the coat of arms of the Royal Borough of Leamington Spa was shipped to Ontario in 1946 and installed in St. John's Anglican Church at Leamington.

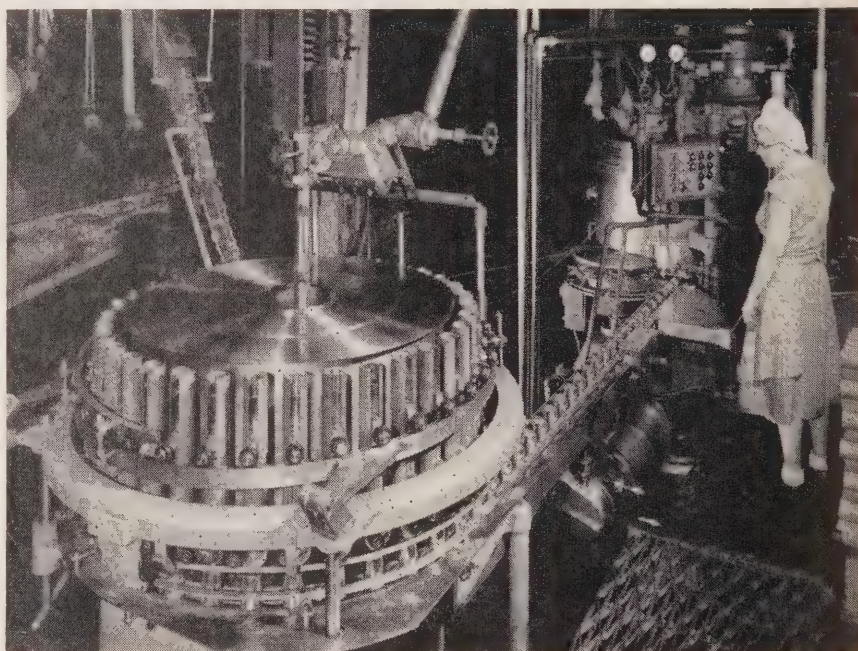
Ties between the two towns were further strengthened with the visit in 1951 of the Mayor of Leamington Spa who formally presented a mayoral badge, which is now worn by the chief magistrates of Leamington on all ceremonial occasions.

The Essex County area of Ontario is one of the oldest settled parts of Canada, rich in the traditions of the country's early French

settlers and the colorful *coureurs-de-bois*. For many years, it was the gateway to the west, for it was from nearby Windsor and Detroit that the fur trade spread westward. During the late 18th and early 19th centuries, from the time that Pontiac laid siege to Detroit in 1763 until the British Army built Fort Malden (now the Fort Malden Museum) near present-day Leamington, the area was a scene of military and naval strategy for England, France and the United States. These ancient rivalries have long since died out, but Leamington and district still feel the beneficial effects of an annual but friendly "invasion" by their neighbors across the border. The strategic location of Leamington—such major United States cities as Detroit, Chicago, Cleveland, Milwaukee, Cincinnati, Columbus, Pittsburgh and Indianapolis are located within a 330-mile radius — make it a popular tourist centre. Visitors from many points in Canada and United States throng Leamington's Seacliff Park on Lake Erie during the summer months.

The facilities of the town itself also include a modern 50-bed hospital, a new \$875,000 high school as well as public and separate schools to take care of the educational needs of the town's junior citizens, and a recently-completed Recreation and Agricultural Centre. In addition, there are large parks and large fair grounds, where each year the Leamington and District Fair is held. The fair is one of the largest of its kind in Western Ontario and has done much to increase the prestige of the town.

In addition to its valuable contribution to the Leamington area, the Heinz Company is attracting shipping from across the Atlantic as British and European firms prepare to move their vessels farther westward across the Great Lakes in search of cargoes. This is seen as a forerunner to an ever-increasing flow of traffic from Europe as the Great Lakes are opened up to foreign shipping with the completion of the St. Lawrence Seaway. Leamington is fortunate in the fact



WITH a regular operating speed of 1,000 cans a minute, this electrically-operated machine in Leamington's Heinz factory fills and seals containers faster than a machine-gun fires bullets.





△ EXTERIOR view of the headquarters of Leamington Public Utilities Commission, which, with a total staff of 17, administers the town's growing electrical and water services.

LEAMINGTON enjoys the distinction of being one of the few Canadian municipalities to have a lady as its chief magistrate. Here Mayor Grace McFarland (extreme left), and left to right: Vice-Chairman Kenneth Omstead, W. S. Otton, Chairman J. L. Graham, W. J. Robinson and Miss Freda Johnson, Secretary, attend a commission meeting.



that it has the necessary docks to accommodate deep-sea vessels.

A community of tree-lined residential streets and a prosperous commercial district, the Leamington of today is a community patterned on the lines of gracious living. The town's progressive weekly newspaper, the *Leamington Post and News*, has served the best interests of the municipality and the surrounding district for many years. Earlier this year, the inauguration of Leamington's Radio Station CJSP was hailed as another example of local enterprise and growth. Further evidence that the prosperity of the district has in no way tempered the town's spirit of progress can be found in such events as the International Plowing Match—an agricultural competition that annually attracts thousands of spectators—was held in the Leamington district in October this year. Visitors to the event had other attractions too: the internationally-famous Jack Miner Bird Sanctuary, near Kingsville, (approximately 10 miles from the site of the plowing match); the Point Pelee National Park, Canada's smallest and most visited national parkland, and other such interesting



points as the nearby Fort Malden Museum, the marine museum at Amherstburg and the experimental farm and science service laboratory at Harrow. There also is famed Pelee Island, 14 miles out in Lake Erie from Leamington, the annual scene of an internationally-known pheasant shoot (see *Ontario Hydro News*, September, 1955).

Leamington and Essex County have experienced almost phenomenal growth since those days when the rollicking songs of the *coureurs-de-*

*bois* shattered the soft silence of the Erie shore. But the spirit of adventure—of enterprise—is still there. The present-day residents of the area are no less adventurous than those early transients, but they are infinitely better equipped to deal with the future. The flint-and-steel age has since been replaced by electricity; and, electricity, as has been demonstrated in so many places and on so many occasions, is the spark that spurs the present into the future. ■



△ EXTERIOR view of Toronto's Maple Leaf Gardens. With a seating capacity of 14,500, the Gardens is most famous for hockey, but its entertainment programs also include opera.

By  
Gordon Murphy

# UPWARD TREND

## Toronto's Famed Maple Leaf Gardens Inaugurates New Escalator System

WHEN the National Hockey League season opened recently in Toronto, many of the 13,000 or more patrons were conveyed to their section of the Maple Leaf Gardens by four, newly-installed escalators.

It was an historic and proud occasion for Toronto hockey fans as these are the first moving stairways ever installed in an indoor arena in North America, and, possibly, in any part of the world.

A few days prior to the first hockey game, Gardens officials also staged what was probably the largest "Open House" ever held in Canada. More than 20,000 people toured the building, using the escalators and visiting such "behind-the-scenes" features as the Hot Stove League headquarters, the Maple Leaf hockey team dressing rooms,

the press room, engine room and ice plant.

The escalators, which were installed by Turnbull Elevator Co., Ltd., of Toronto, were built at a total cost to the Maple Leaf Gardens of close to \$200,000, including necessary structural changes to the building. Two are installed in the building's eastern section and two in the western section. The escalators, which are completely reversible, will all be operated in the "up" direction as spectators arrive for events in the Gardens and in the "down" direction as they leave.

Moving passengers at the rate of 5,000 each, the four escalators have a total carrying capacity of 20,000 persons an hour. For the information of the uninitiated, the Gardens is divided into four sections — the "Red," just a few feet above the

ice level. Immediately above is the "Blue" section. Next is the "Green," while the "Gray" seats are located at the top of the arena. The escalators will lift passengers from the Gardens' lobby to the "Blue" floor, roughly 15 feet above the ice surface. Patrons with "Green" and "Gray" tickets will have to climb steps from the "Blue" section to reach their seats. But they are grateful for the partial "lift" as a person would have to climb 90 steps from the Gardens' lobby to the "Grays" without the escalators. This is quite a trip for even the huskiest customer as the dome of this large sports structure is 150 feet above "centre ice" — the equivalent of a 14-storey building.

The average person climbing stairs to the "Blues" takes about 45 seconds; the escalators will take him up in an effortless 30 seconds. A





△

HOCKEY was never like this! With Miss Turnbull (Shirley Bassett), who acted as official hostess during the Gardens' recent "open house," are Sid Smith, Leaf captain (left), and Harry Lumley, "goalie," right.



▷

ALFRED HILL, a member of the Gardens' electrical staff, inspects one of the 10-horsepower motors, which operate the newly-installed escalators.

spectator, whose destination is in the "Greens" section will have 50 percent less climbing and a "Grays" spectator about one-third less.

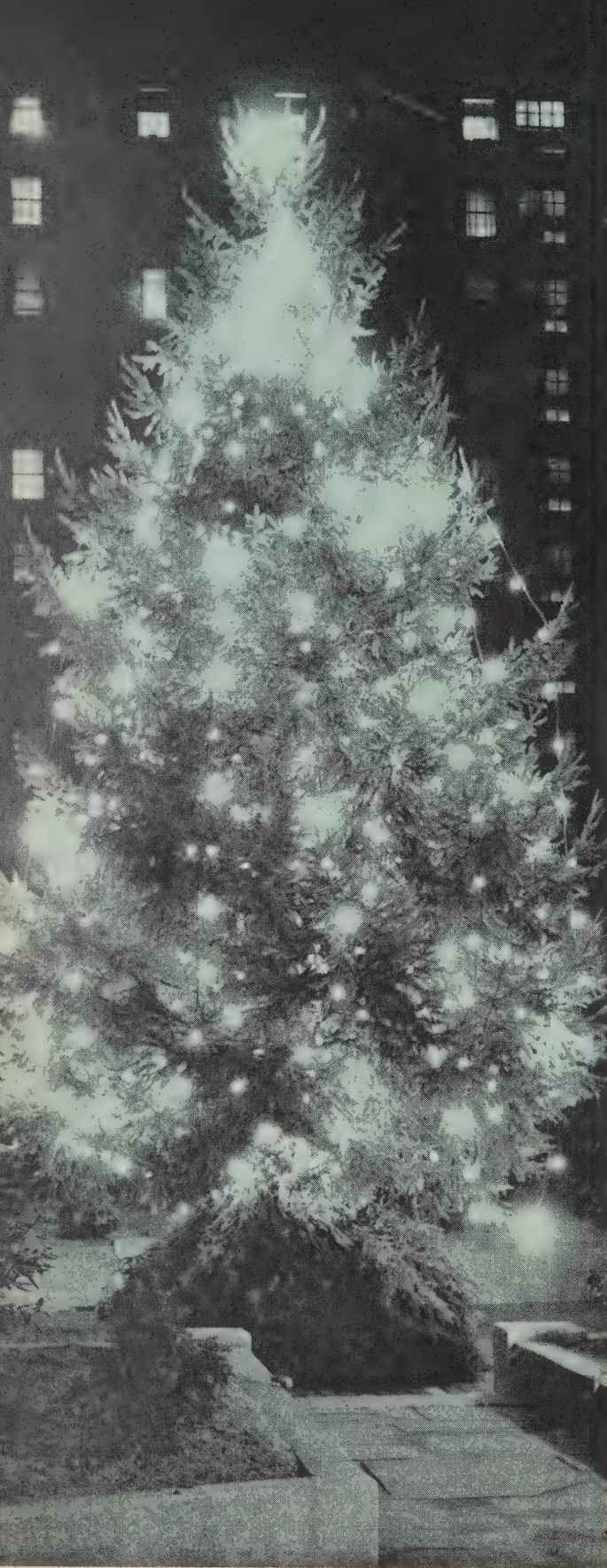
Each of the four escalators is a completely separate unit consisting of truss, track, driving mechanism and control system. All the escalators move at a 30-degree incline and each stairway has 83 steps, which are attached to an endless chain. This chain is driven at 90 feet per minute by a 10-horsepower, 208-volt electric motor through a worm and a gear reducer. The controls consist of keyed, directional-starting switches and stop buttons. Safety devices are arranged to stop the escalators immediately in the event of an emergency.

#### Dual Installations

The escalators have been installed in pairs at either end of the building to reduce walking inside the Gardens to a minimum. This is one of the two arrangements generally used when installing escalators in multiple units. The "criss-cross pattern" is frequently used in department stores, where passengers are encouraged to walk to the opposite side of the installation, thus finding themselves facing merchandise, which stimulates what is known in the trade as "impulse buying."

The Gardens' technical superintendent, Douglas Morris, had a big job on his hands to make way for the sports arena's new escalators. First, the entire electrical system of the huge building had to be re-organized. Wellways on the east side of the building now cut through positions, which formerly housed the arena's generating room. Remote control panels for lighting and ventilation were moved along with hundreds of wires, cables and conduit. Two generators, each weighing several tons, were shifted to new quarters. This work was carried on without obstructing existing stairways. ■





# For a

From an infant enterprise in 1931, Yuletide lighting has today become a profitable Canadian industry

**B**RIGHTENING Christmas for Canadians has been an enlightening experience for the electrical and novelty lighting industries for the past quarter-century. The project has blossomed from a few colored lights on Christmas trees to community-wide contests to see who can out-light, out-decorate and outshine everybody else in town.

The Junior Chamber of Commerce and other public-spirited groups promote the contests, determined to see that "if it can't be a white Christmas, let's make it a bright Christmas!" Designed to spread Christmas cheer, come rain, snow or sunshine, the contests encourage all-out efforts at decorating homes, apartments, business and civic buildings.

Christmas tree lights began with lighted candles, then, in the same way that electric lamps nudged out gas and kerosene lamps along civilization's march of progress—colored lights took over from lighted candles. So popular did the practice become that the lights multiplied on the Yule tree, spread around the room, moved outdoors to the front door and the porch, then climbed to the rooftop and crept up the trees on the lawn.

Topping this Broadway-at-night effect, a cardboard sled and reindeer has pulled up on many lawns and a cardboard Santa is seen climbing a ladder to the chimney. Spotlights outshine the colored lights in their eagerness to light his way and ensure that no passerby will miss nothing of the excitement.

Downtown, large colored lights strung across the streets foster Christmas spirit for busy shoppers. And in most communities, the brightest spot of all is the chief municipal building, usually the town or city hall.

Christmas lighting was a tender, \$150,000 Canadian industry in 1931. It has matured into a lusty enter-



# Bright Christmas

prise of upwards of \$3,000,000 annually. Manufacture of colored bulbs involves less than a third of this total. The balance is represented by the production of lighting equipment and the novelties into which the lamps are fitted.

## Outdoor Lighting

Outdoor lighting is nosing out indoor Christmas tree lighting in the volume of sales. Louis Szell, President of Noma Lites Canada Limited, Toronto, says that the sales of outdoor lighting products doubled in 1953 and are expected to increase by another 50 percent this year. Universal Electric Products Co. Limited at Montreal, the other manufacturer in the field, is also gearing up to keep in step with the growing demand.

In 1923, Japanese colored lights dominated the Canadian market. Today they still furnish about one-third the supply. Only through improved costs and volume production can Canadian manufacturers compete with this import trade. Canadian Westinghouse Company Ltd. estimates that its share of the market this year will run to something like 6,000 Christmas tree lamps, 200,000 bubble lamps and 1,250,000 outdoor Christmas lights. These last are painted on the inside to prevent the elements rubbing off the colors.

Red and blue lamps predominate in public favor. Others are green, orange, yellow and white.

Other industries contribute to this Christmas glow. An estimated 30,000,000 feet of single-conductor wire go into the string units. This wire represents another \$225,000 business in "Operation Christmas Lighting."

Equally important in all this glitter and glare is the power that lights the bulbs. Wartime restrictions necessarily eliminated this Christmas touch but made the outdoor lights seem all the brighter when they finally shone again. Now they twinkle cheerily in business and residential sections of town and cities and throughout the rural areas. The same reliable power that roasts the turkey gives the colored lights their magic touch in the festive season. ■



DECORATIVE Christmas lighting has spread from the Yule tree to the front door and even climbed to the rooftops of many homes.

THE growing popularity of this form of decoration explains why the industry has become a \$3 million-a-year enterprise.

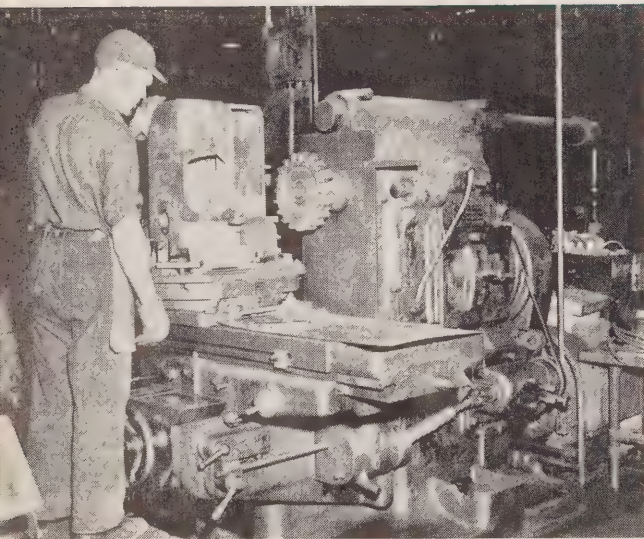




# Clean Sweep

Unique problems and equipment  
confront Ontario Hydro's changeover  
crews during mammoth project at  
Fergus' world-famous Beatty Bros. plant

By FRANK C. WOOD



FOUNDED in 1874 with a staff of seven, ▷  
the Beatty Bros. plant at Fergus today  
covers 11 acres and employs about 1,500.

▷ ONE of the larger machines converted for  
60-cycles was this electric horizontal  
miller, which is shown milling a motor  
face for a Beatty deep well pump case.

ASSEMBLY line in the Ontario factory  
which is famous for its washing ma-  
chines. Some 3,429 items were changed  
over during standardization operations.





**B**ACK in 1874 (famous as the year in which Alexander Graham Bell invented the telephone) George and Matthew Beatty launched into business on their own account, hiring seven men to make agricultural implements in a rented factory at Fergus.

The brothers apparently established the business on a solid foundation, for by 1955 the staff of seven had increased to 1,500 in Canada and abroad, while the first factory has grown into a plant at Fergus

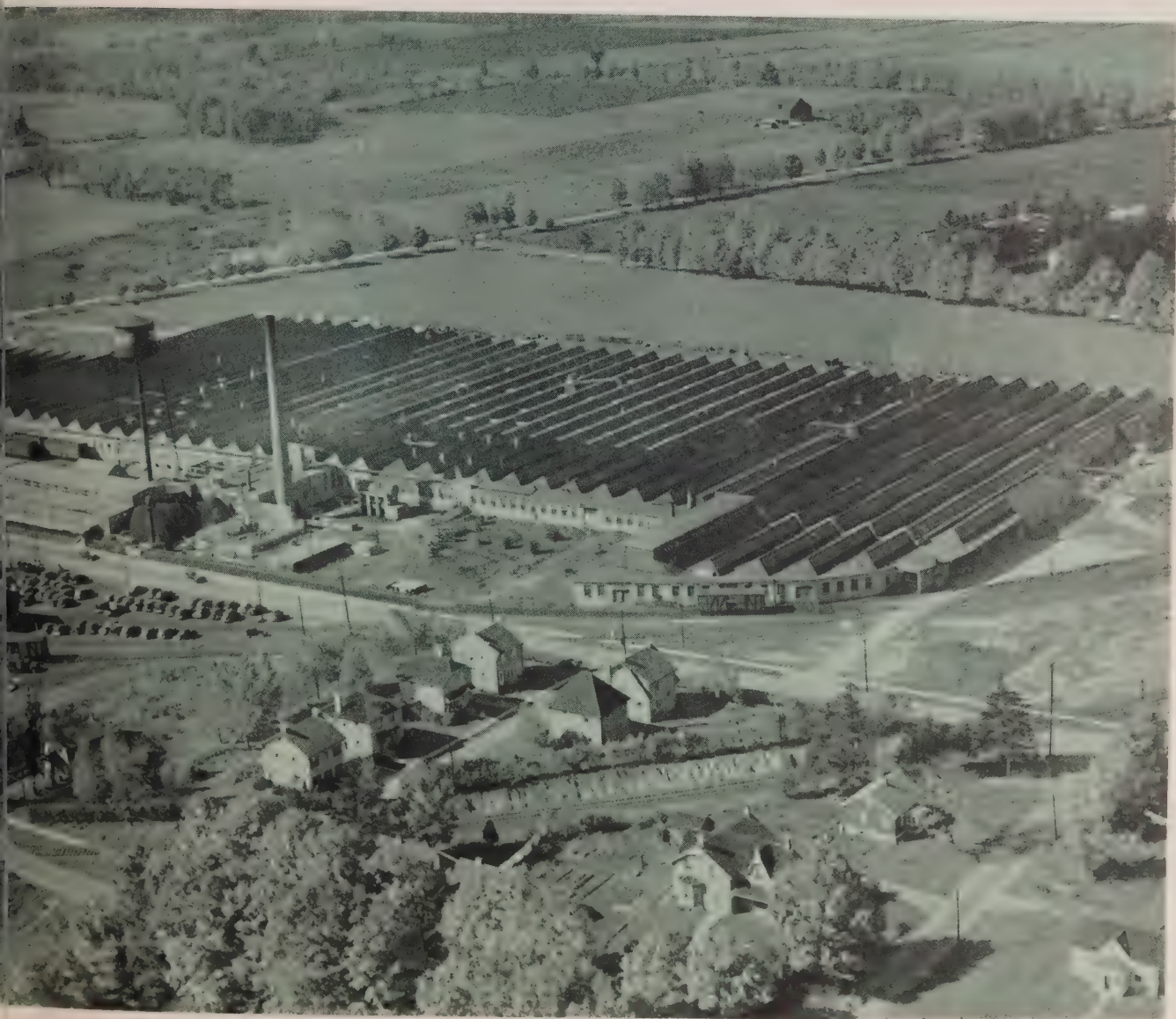
occupying more than 11 acres. The name of Beatty Bros. Limited, as any Ontario citizen will tell you, has become world famous.

Changing over this huge plant for 60-cycle operation, as can be readily appreciated, presented Ontario Hydro with a major industrial standardization assignment during recent operations in Wellington County.

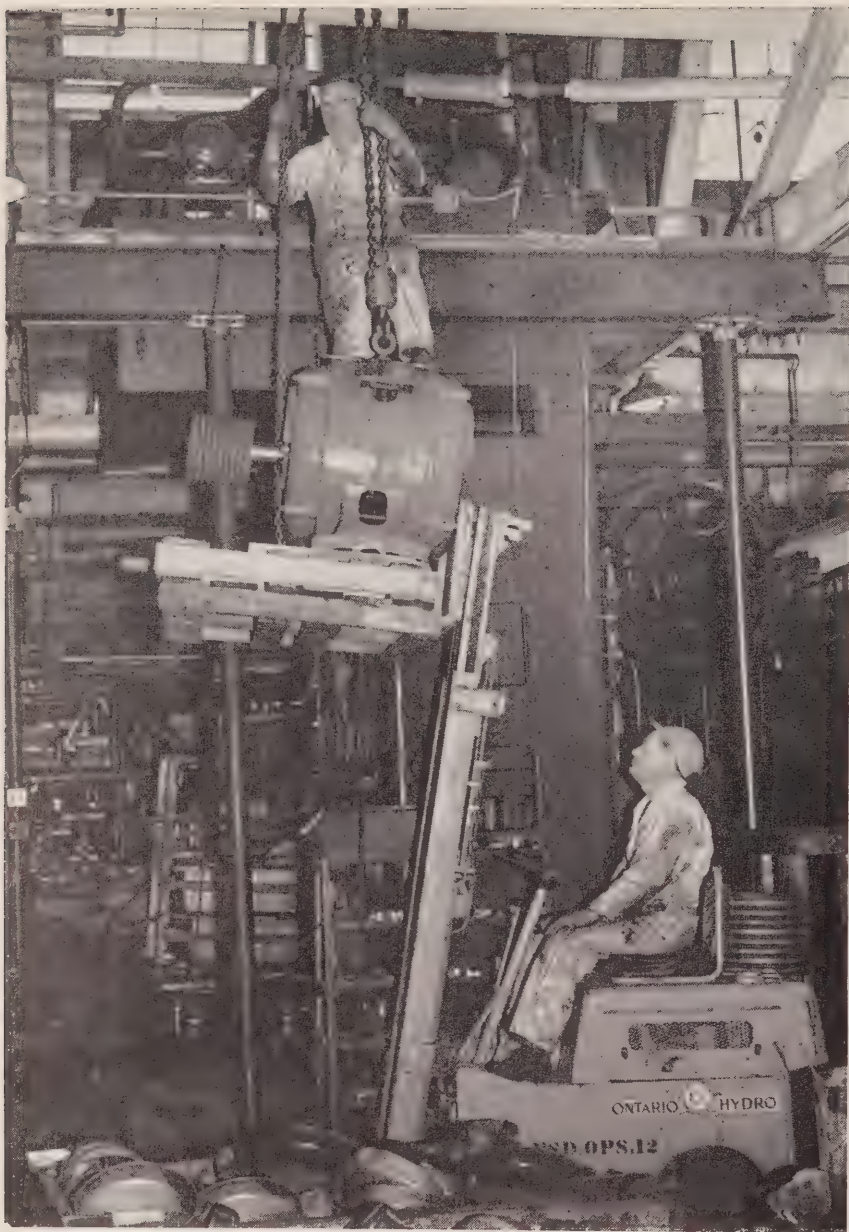
While the program, affecting the other 1,224 domestic, commercial

and power customers in Fergus, was planned for completion in three weeks, standardization of the main Beatty plant was scheduled as a six-month task. Some 3,429 items operating at 25 cycles were inventoried for conversion. The long list of widely-varying equipment included hundreds of fluorescent lights, cash registers, rectifiers, buffers, power hammers, swing saws, vertical mills, wringer testers, lathes, a dust collector, a 400-ton press and many

*(Continued on page 24)*







△ A NEW 60-cycle motor to operate a power press is hoisted into position. The power press, capable of 400-lb. pressures was one of the largest pieces changed over.

▷ HYDRO technicians Fred Dalgleish (left), and Ren. McCourt remount a starter switch for a 60-cycle motor installed to operate a lathe



other machines used in the manufacture of some 650 items.

Sequence of changeover at this important plant was scheduled following conferences between Ontario Hydro engineers and Beatty Bros. personnel, including K. W. Lymburner, Technical Supervisor; A. A. P. Menzies, Production Manager, and Fred Pearse, Electrical Foreman.

The fact that operations in the plant were to take six months posed a problem as converted equipment had to be operated at 60 cycles. At the same time it was necessary to have 25-cycle frequency available to power items remaining to be standardized. But the problem was dealt with by connecting, as required, three of Ontario Hydro's mobile converters to the distribution lines supplying the plant.

These converters, by changing the frequency from 25 to 60 cycles, enabled the immediate operation of standardized equipment. Conversely, when 60-cycle power, supplied by the Commission's transmission lines, was switched on in Fergus in September this year, the converters reversed the process, changing 60-cycle power to 25 cycles to operate equipment awaiting changeover.

#### Heavy Load Demand

It was not practicable, however, to operate the plant's spot welders by means of frequency converters because of their heavy load demand—two of the machines being rated at 15 kva; two at 40; one at 58; three



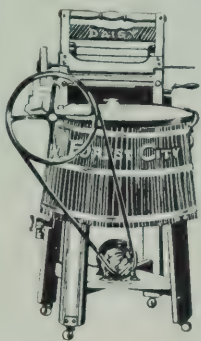
at 75; two at 100 and one at 125. This difficulty was easily circumvented by stockpiling production from the welders ahead of schedule and then releasing the equipment for conversion. In order to minimize the time these machines would be out of service, they were wired for dual frequency, operating at 25 cycles until "cutover" day when they were re-connected for 60-cycle operation. Moreover, standardization of this vital equipment was simplified because several of the welders were of the dual frequency type, conversion of these merely involving changing the connections.

One phase of the operation for converting these welders involved the installation of a 500-foot length of three-inch conduit pipe.

This equipment is of great importance in the fabrication of many Beatty products, with the larger machines making welds up to five feet long in water storage tanks. An interesting result of this conversion is that, at 60-cycle frequency, the rating of the 75 kva welders is increased to 135 kva and that of the 100 kva to 200 kva.

A pleasing feature of this big changeover operation was the fact that it was not necessary to standardize 62 of the 25-cycle motors in the plant. As part of the Commission's policy to reduce standardization costs, Hydro loans 25-cycle motors to industrial customers installing additional equipment in cases where conversion is to take place within a given time. The "loaner" motors are used until the higher frequency is available at the plant, at which time new 60-cycle motors are installed and the "loaners" are returned to the Commission.

By this plan the Commission and the industrial customer are saved the cost of converting 25-cycle motors which would have been in use for only a comparatively short time before changeover. Additionally, the customer is frequently able to economize because 60-cycle motors are often cheaper than their 25-cycle counterparts.



ONE of Canada's first electric washing machines — the "Forest City" — came off the assembly lines at Beatty Bros. in 1914.

Manufacturing operations in the Beatty plant necessitate the use of large compressor units with capacities ranging up to 850 cubic feet a minute. Standardization of the air-compressor equipment involved two motors, up to 150 horsepower.

Other interesting equipment included a 688-foot long conveyor at the finishing line. This lengthy conveyor can handle 510 parts — legs or tubs of washing machines, for instance — simultaneously.

Mention of washing machines brings to mind the fact that Beatty Bros. made the first electric washing machine ever produced in Canada in 1914. This pioneer labor-saving device—known as the "Forest City"—was constructed largely of wood. While a small electric motor activated the agitator, the wringer was powered by the housewife's strong right arm.

The "Forest City" sold for \$119.00 and its ready acceptance by housewives, eager to lighten their household tasks, encouraged the production of continually improving models. The modern washers which travel, section by section, on the overhead conveyor at the big Beatty plant, have electrically-operated safety wringers, some have pumps to empty the tubs, and all are finished in gleaming enamel, bearing scant

resemblance to the pioneer "Forest City" model of 1914.

But, undoubtedly, the laundry equipment, which will be produced by this progressive company 41 years hence, will embody many more radical changes and improvements. Further progress of this vast organization, which stemmed from the determination and integrity of George and Matthew Beatty, will be facilitated because appliances, after 1959, will be manufactured solely for operation at the modern Queen's University. ■

## SCHOLARSHIPS

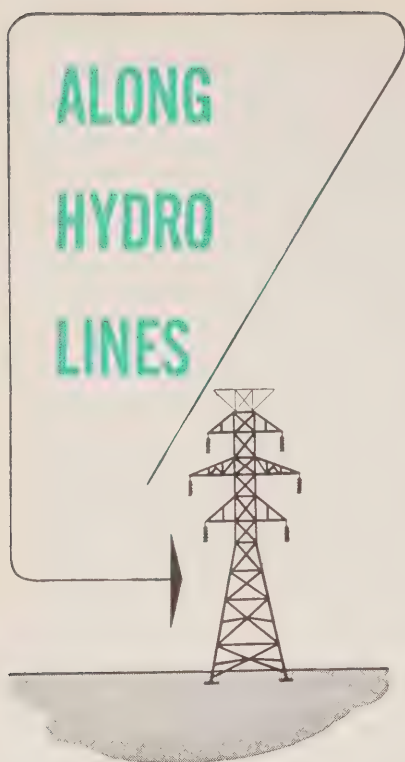
(Continued from page 7)

gress in his studies, having previously gained two Dominion-Provincial bursaries and the Alumni of Toronto Scholarship for the student with the highest marks entering the Lakehead Technical Institute. Born at Port Arthur on August 2, 1936, he received his early education at S.S. No. 6, McIntyre. He also attended Port Arthur Technical and Commercial High School and obtained his senior matriculation at the Port Arthur Collegiate Institute.

Interested in basketball, curling and photography, he was a member of the Tech Hi-Y basketball team, champions of the inter-school Hi-Y League in 1952-53. During the past summer, he worked in the engineering office of Construction Aggregates Corporation and is now studying electrical engineering at Queen's University. ■

## FOR SALE

Slightly used, 20-ton Herbert Morris worm gear, chain hoist and geared travel trolley. Price new, approximately \$2,000.00 Apply to D. N. Durward, Manager, Galt P.U.C., 62 Dickson Street. 'Phone 2230. Galt, Ontario



#### **Lay Underwater Cable To Island**

Fawn Island, lying in the St. Clair River, near the Village of Sombra, has been connected to the mainland by the recent laying of a 990-foot underwater distribution cable. The work was in charge of J. F. Ridley, Manager of Ontario Hydro's Wallaceburg Operating Area. Laid at a depth of 43 feet, the cable, which is scheduled for service next spring, will serve several cottagers and is expected to spur the island's development as a summer resort. Power will be supplied to the 40-acre island, which bears the registered name of Woodtick Island, at 4,800 volts.

#### **Clinton Announces Salary Increases**

Increases in salaries for nine employees have been announced by Clinton Public Utilities Commission. Six linemen have each received a 25-cent an hour raise; wages of two office employees were raised \$3 per week, while Superintendent J. E. Rands received a \$200 increase in his annual salary.

#### **Waterloo P.U.C. Plans Betterment Program**

Waterloo P.U.C. will proceed with a \$215,680 program of extensions and improvements to the electrical facilities of the utility during 1955 and 1956 and will also purchase 13.8 kv. sub-transmission equipment from Ontario Hydro.

#### **Retiring Toronto Employee Honored**

Retiring on October 31 this year with a record of almost 45 years of continuous faithful service, Fred J. Vincent was feted by colleagues at a complimentary dinner tendered by fellow-employees of the Toronto Hydro-Electric System. Mr. Vincent, who commenced his service with the Toronto system on March 13, 1911, has the longest record of service of any retired employee and only one active employee has a longer record of service. This venerable employee, who started his career in the Toronto system's Meter Department, has served successively in the Inspection, Power Sales and Power Departments, as well as assistant to the manager of the Demand and Rates Department for the past eight years.

#### **Point Edward P.U.C. Awards Contract**

Point Edward Public Utilities Commission has announced the award of a contract to H. G. Horner, a local contractor, for the construction of a new headquarters building. The Point Edward firm was one of seven submitting bids on the 70 x 36-foot, one-storey structure, which will be of brick, cement block and glass construction. Scheduled for completion next April, the new building has been planned to provide space for anticipated expansion of operations and increases in staff for the next 15 to 20 years. Space not required by the utility when the building is completed will be rented to the municipality for the accommodation of the village clerk and the police department.

#### **North Bay Hydro Plans Lighting Survey**

Manager B. M. Graham has been authorized by North Bay Hydro-Electric Commission to prepare a report on and recommendations for improving the city's street lighting system. With 856 street fixtures in operation at present, the local commission is desirous of effecting further increases in the illumination of certain thoroughfares. Mr. Graham, who has intimated that the survey will entail a month or more of study, states that he will confer with the police department to ascertain the points where a higher degree of lighting is required to meet the demands of increasing pedestrian and vehicular traffic.

#### **Hydro Consultant Receives Promotion**

Kent Barker, consultant to Ontario Hydro in the rehabilitation program for communities affected by the St. Lawrence Power Project, has been promoted to associate professor in the University of Toronto's School of Architecture.

An honor graduate of the University of Toronto, Professor Barker did postgraduate work before World War II, when he joined the RCNVR, being attached to the Directorate of Plans at naval headquarters in Ottawa. He became associated with the Ontario Department of Planning and Development when it was organized in 1945 and a member of the university staff in 1946.

#### **Port Colborne Favors New Pension Plan**

Approval of a supplementary plan inaugurated by the Municipal Hydro-Electric Pension and Insurance Committee has been announced by Port Colborne Hydro-Electric Commission. Cost of the supplementary plan will be shared by the commission and the employees, and will result in increases in pensions on retirement varying between 20 and 25 percent.



### **Long-Service Sales Executive Retires**

A lengthy career of service to Canada's electrical industry came to a close recently with the retirement from the Canadian Westinghouse Company of Clarence W. (Count) Hookway. The widely-known veteran of the company's District Apparatus Division who was Ontario district manager for many years retired following 44 years with the firm.

Between 1919 and 1934 Mr. Hookway was responsible for the sale of Westinghouse apparatus to Ontario Hydro and he played an important role in many of the projects carried out by the Commission and other customers. He was appointed manager of the Ontario district in 1934 and four years ago became a special representative for the District Apparatus Division.

### **Kitchener P.U.C. Reports Electricity Profits**

Savings on high tension transformer operations are believed to be largely responsible for increased profits in the electrical department of Kitchener P.U.C. This utility took over all high tension facilities serving Kitchener and Waterloo at the beginning of 1955. Profits in the electrical department of Kitchener P.U.C. totalled \$299,344 to the end of September this year, compared with a profit of \$184,115 in the same period last year.

### **Tillsonburg P.U.C. Plans New Building**

Tillsonburg P.U.C. has announced the sale of its office building on Broadway Street, the town's main thoroughfare, at a price of \$50,000. The local commission has engaged an architect to design a new office building to be erected at the site of the utility's present frame service building.

The Tillsonburg utility is also planning construction of a new service centre, which will include a stores room, garage and workshop.



## **CANADA'S LARGEST**

**REGARDED** as the largest steel casting ever produced in Canada, a giant hydro-electric runner hub, has been completed by the Steel Foundry Division of Canadian Car and Foundry Company, Limited, at Montreal.

The huge casting — the central portion of the runner which holds the adjustable blades of a reversible pump-turbine — is one of an order of six being produced by Canadian Car and Foundry and supplied by the John Inglis Company of Toronto for an English Electric Company contract from Ontario Hydro. Completed after a lengthy period of preparation and planning by skilled foundrymen and technicians, it has a total shipping weight of 125,000 pounds. The runner hub will be installed in Ontario Hydro's Sir Adam Beck Pumping-Generating Station at Niagara Falls. The station will consist of six reversible units with a total installed capacity of 228,000 horsepower and will be in initial operation in 1956.

### **Kincardine Names Secretary-Treasurer**

Succeeding M. C. McKenzie, who has been named assistant to the Business Administrator, Woodstock Board of Education, Miss Winona Nelson, was chosen Secretary-Treasurer of Kincardine Public Utilities Commission at a recent meeting. Selected from eight applicants, Miss Nelson officially assumed her new duties at the end of November.

### **P.U.C. Staff Men Attend Course**

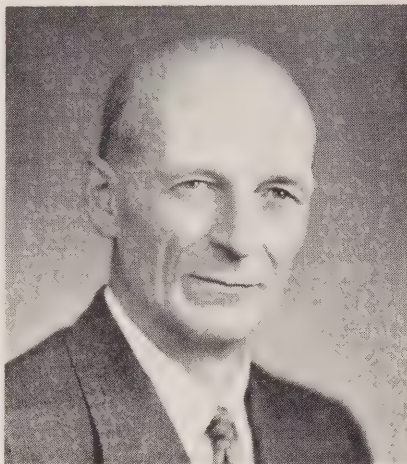
Arranged by Chairman Sam Ashton, a recent 10-hour course in safety training has been completed by 10 key representatives of Port Arthur Public Utilities Commission's three departments. The course, conducted by Murray Handford, Port Arthur, consisted of lectures, demonstrations, round-table discussions and film presentations.

## APPOINT NIAGARA REGION MANAGER

**J.** R. McCullough, Operations Engineer of the Niagara Region for the past seven years, has been appointed Manager, succeeding A. S. Robertson, who retired last month (see *Ontario Hydro News* — November, 1955). Replacing Mr. McCullough is M. D. Jones, former Electrical Maintenance Superintendent.

The new Manager, Mr. McCullough, joined Ontario Hydro's engineering staff in 1926, and after a short time with the Meter Department in Toronto, was transferred to Port Arthur as an engineer with the Commission's Thunder Bay System, now part of the Northwestern Region.

In 1937, he was appointed Meter and Relay Engineer in the Belleville area, and served in this district



**J. R. McCULLOUGH**

until his appointment as Niagara Region Operations Engineer in 1948. In his new post as Manager, Mr. McCullough will be responsible for

administering the operation and maintenance of all Commission properties, and for the conduct of all matters pertaining to customer relations in the region.

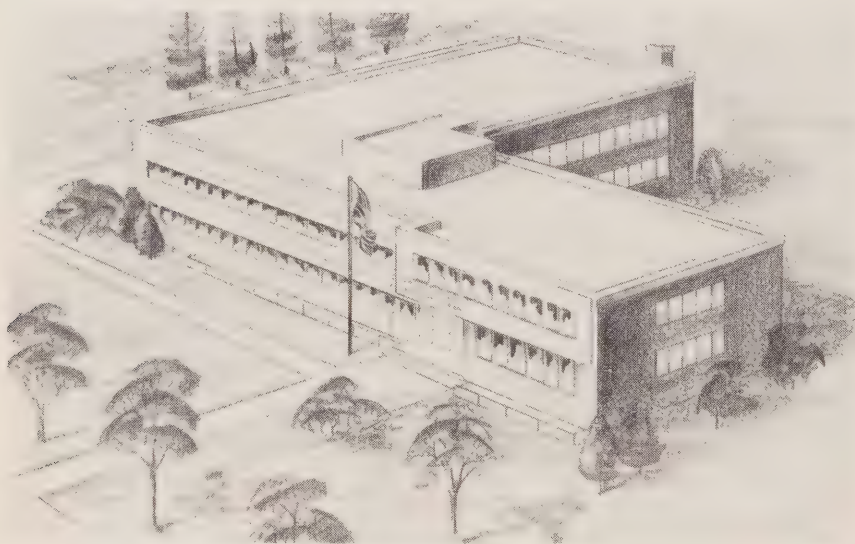
Mr. McCullough is a graduate of the University of Toronto, with the degree of Bachelor of Applied Science. He is a member of the Association of Professional Engineers of Ontario and the American Institute of Electrical Engineers.

### M. D. Jones

M. D. Jones, who succeeds Mr. McCullough as Niagara Region Operations Engineer, has been on the Commission's Niagara staff since 1929. He became Line Engineer in the Line Maintenance Section in



**M. D. JONES**



## NEW EASTERN REGION HEADQUARTERS

**ONTARIO** Hydro has announced the award of a contract to Thomas Fuller Construction Company Ltd., Ottawa, Ontario, for the construction of a new Eastern Regional Office Building in the City of Ottawa. The Fuller organization, which submitted a bid of \$499,652, was the lowest of 11 tenderers. The other bids ranged from \$513,417 to \$556,000. The new Ontario Hydro Regional Office Building will provide the necessary accommodation to assure an efficient and economical operation in the growing Eastern Region.

May of that year, following graduation with a B.Sc. degree from the University of Toronto.

Eight years later, in May, 1937, Mr. Jones was appointed Line Maintenance Supervisor, and then, in 1944, Line Superintendent and Assistant District Electrical Maintenance Superintendent. In April, 1948, he was appointed Electrical Maintenance Superintendent, and has held this post until he was recently appointed Operations Engineer.

An active sportsman, Mr. Jones is a member of the Lookout Point Golf Club, the Niagara Boat Club, and the Hepworth Anglers Club. ■



# NINETEEN HUNDRED AND FIFTY-SIX

## JANUARY

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## OCTOBER

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## NOVEMBER

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Merry Christmas<sup>\*</sup>  
and a  
Happy New Year!





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1955

## A

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Appoint Niagara Region Manager	December

### ASSOCIATION OF PROFESSIONAL ENGINEERS

J. R. Montague Named President	January
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### ASSOCIATION OF MUNICIPAL ELECTRICAL UTILITIES

Touching Tribute	March
Howard Heads A.M.E.U.	March
Municipalities Measuring Up (A. W. H. Taber)	March
Standards Report	March
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"At The Crossroads"	June
Bills And Budgets	July-August
Municipal Standards Gain Weight	July-August
Briefing On Budgets	November

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Banks, E. H. (Appointment)	March
Brittle Fractures (Sir Claude Gibb)	March
Bowman, Abraham M. (He Practises At Preston)	May
Brantford P.U.C. (New Lease On Life)	June
Bills and Budgets (Eastern A.M.E.U. Conference)	July-August
Brodie Elevator (Melbourne — Corn Is No Joke Here)	July-August
Bancroft Operating Area	July-August
Burnham, E. L. — Belleville (Peterborough Presentation)	July-August
Brush Warfare	September
Bradden, M. E. (Named Rehabilitation Information Officer)	September
Briefing on Budgets (A.M.E.U. Western Conference)	November
Bolton, Warren P. (Obituary)	November
Beatty Bros., Fergus (Clean Sweep)	December
Barker, Kent (Appointed Associate Professor)	December

### BECK, SIR ADAM, NO. 2 PROJECT

Key Role	March
Salient Factor	October
Rolling Back The Frontier	December
Canada's Largest (Runner Hub)	December

## C

Christian Island (Two More Members)	January
Craven, C. J. (Dresden — Retirement)	January
Cliff, D. P. (Steady Growth)	March
Chapin, Col. W. S. (Will Pace Hydro)	March
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Correspondents Receive Awards	May
Canadian Olympic Training Plan (Ambitious Project)	May
Canadian Adequate Wiring Bureau (Marked Expansion)	June
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ONTARIO HYDRO

# *News*

JANUARY, 1956

WARP AND WOOL



# ONTARIO HYDRO

# News

JANUARY, 1956

VOLUME 43, NUMBER 1

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## THE STURDY HUB

**"L**ike a wheel, Canada turns on the sturdy hub of Ontario. . ."

The foregoing quotation is from a recent article in the Christian Science Monitor by that noted Canadian writer, Bruce Hutchison. Three ingredients, Mr. Hutchison points out, have combined to make Ontario "the dominant factor in Canada's political and business life." The distinguished journalist names "the cheap transportation and water power of the St. Lawrence and Great Lakes complex" as one of the ingredients.

Such a heartening tribute to the role of electricity in the province's healthy and vigorous economy is supported by actual facts. In 1955, for instance, power demands on Hydro's Southern Ontario System increased 14 per cent over 1954. This increase, significantly enough, was more than double the average, annual long-term rate of growth.

Faced with such a sharp increase in power requirements, the Commission has struck an optimistic note at the beginning of 1956 — Hydro's Golden Jubilee Year — by its decision to proceed with the immediate enlargement of two major generating stations.

An announcement elsewhere in this issue indicates that two additional, 75,000-kilowatt units will be installed at the new Sir Adam Beck-Niagara Generating Station No. 2, while a 200,000-kilowatt unit will be added at the Richard L. Hearn steam station at Toronto.

In providing this additional installed capacity of 350,000 kilowatts in time to meet the peak requirements of 1957 and 1958, the Commission is anticipating the possibility of an average annual load growth in the next two years or more, similar to the growth trend experienced in the period 1950-1955.

The additional units at Toronto and Niagara Falls combined with previously scheduled resources and those now available will provide sufficient capacity to meet such a demand and at the same time establish a reasonable reserve to take care of such contingencies as low water conditions, equipment failure or abnormal load growth.

Thus, this vast and vigorous province is assured of a continuing, adequate supply of power — an essential lubricant for "the sturdy hub."

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## COVER SHOTS

In this issue we salute the Town of Listowel, a bustling Hydro municipality, where electricity plays a key role in operating such machines as the warping machine, depicted on the front cover, in the Imperial Cloth Company plant.

Supporting cables spanning the river and present ship canal, the 335-foot towers (the tallest transmission towers ever built by Ontario Hydro), shown on the back cover, dominate the north shore of the St. Lawrence River at the site of the power project near Cornwall.





*Come, see the north wind's masonry.  
Out of an unseen quarry evermore  
Furnished with tile, the fierce artificer  
Curves his white bastions with projected roof  
Round every windward stake, or tree, or door.*

— Emerson, "The Snow-Storm."

# ST. LAWRENCE



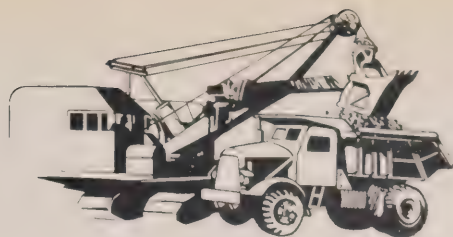
AERIAL view of the 4,500-foot steel cell cofferdam across the north channel of the St. Lawrence River, with excavation for the foundations of the Ontario Hydro (right foreground), and the New York State Power Authority (upper left), powerhouses in progress in the unwatered area above the cofferdam.



ON the United States side of the river, construction of the Long Sault control dam is in progress. Railway sidings and construction plant associated with this big project are also visible on the left.



# BEEHIVE



In less than 18 months, Ontario Hydro and New York State Power Authority construction forces have made impressive headway in the building of the St. Lawrence Power Project

**A** BEEHIVE of activity? That might be one way to describe it, but even the bees, with all their devotion to duty and their genius for organization, couldn't come up to the pace being set by Ontario Hydro and the Power Authority of the State of New York in the construction of the St. Lawrence Power Project.

It is less than 18 months ago—in August, 1954—that the first contract was awarded by Ontario Hydro for the St. Lawrence Power Project. Now, there are some 2,700 men hard at work on the Canadian side of the river harnessing the power potential of the 45-mile long section of the St. Lawrence's International Rapids, and the number of workers is expected to reach 5,500 in the late fall of 1956 or early in 1957. On the United States

side of the international power development, there are upwards of 3,200 men also hard at work, with the number expected to increase comparably to the scale on the Canadian side of the river.

The principal structures of the St. Lawrence Power Project, regarded as one of the world's major construction jobs, consist of two powerhouses and two dams—the Long Sault dam and the Iroquois dam.

Spanning the channel between the eastern end of Barnhart Island and the Canadian shore, two miles west of Cornwall, the two powerhouses will adjoin one another on either side of the international boundary. Serving also as a gravity-type dam, the two structures will

reach to a height of some 162 feet above the foundations. Together they will have an overall length of 3,300 feet and operate at an average head of 83 feet.

As has been mentioned in previous articles (see *Ontario Hydro News*—March, 1955) the two powerhouses will consist of 32 units—16 in each plant—and will be unique in the fact that they will not have a conventional superstructure over the generating rooms. The generators will, however, be protected by removable covers. Ontario Hydro's plant—to be known as "The Robert H. Saunders—St. Lawrence Generating Station" as a tribute to the Commission's former Chairman—is scheduled for initial operation in the summer of 1958 and completion by 1960. Ontario's share of the 1,640,000-kilowatt project will be 820,000 kilowatts.

Excavation at the powerhouse site is advancing rapidly, with concreting operations scheduled for early this year. This work is being carried out in a large unwatered area in the north channel of the St. Lawrence. The unwatering involved the building of an upstream cofferdam (stretching 500 feet across the channel from Sheek Island on the Canadian side of the channel to Barnhart Island on the United States side) and a mammoth.

(Continued on page 4)



◁ REPLACING a temporary pontoon structure, located downstream from this point, Barnhart Bridge will carry rail and road traffic between Barnhart Island and U.S. mainland.



4,500-foot steel cell cofferdam downstream from the site, which spans the channel from the Canadian mainland to Barnhart Island.

The Long Sault dam, on which substantial progress has been made in recent months by the Power Authority of the State of New York, is located upstream from the powerhouse structures. The first stage cofferdams have been completed and excavation, drilling and grouting for the dam foundation are now well under way, so well under way, in fact, that the first concrete was poured in October, 1955. When completed in 1958, the Long Sault dam will be approximately 2,250 feet long, extending from the upper end of Barnhart Island to the American mainland. It will serve to control the water in the headpond, allowing any excess amounts to bypass the powerhouses as required.

New York State Power Authority plans for construction of the Iroquois control dam are also well advanced, the first concrete having

been poured on November 11 last year. Excavation for the south abutment of the dam is progressing, the erection of a concreting plant is complete and the hauling and stockpiling of concrete aggregates are well under way.

The Iroquois dam, a 2,540-foot long structure, 25 miles upstream from the Long Sault dam, will extend from the vicinity of Iroquois Point, on the Canadian side, to Point Rockway on the United States side. Scheduled for completion in 1957, its function will be to regulate the outflow of water from Lake Ontario.

Since work associated with construction of the powerhouses could not be allowed to interfere with navigation along the present 14-foot Cornwall Canal, Hydro engineers built two tunnels with diameters of 10 feet and 16 feet respectively under the canal to provide access to the powerhouse area. The larger tunnel will accommodate equipment up to a 22-ton Euclid truck, while the smaller passageway is for pedes-

trian traffic and the movement of concrete aggregate by conveyor belt. To permit passage of equipment of greater size, a retractable Bailey bridge—believed to be the first of its kind in the world — was built in the vicinity of Lock 19 on the Cornwall Canal. The bridge was designed for loads up to 90 tons.

Construction of two additional tunnels, with the same dimensions as the existing ones, is progressing in the powerhouse area. These tunnels are being built in conformity with plans for altering the present course of the Cornwall Canal. Diversion of the canal will permit completion of 3½ miles of dyking on the Canadian shore in the area extending north and west of the powerhouses. This long dyke, known as the Cornwall dyke, together with the main dams and the south forebay dyke on Barnhart Island, will impound the waters of the St. Lawrence, creating a lake stretching some 35 miles upstream.

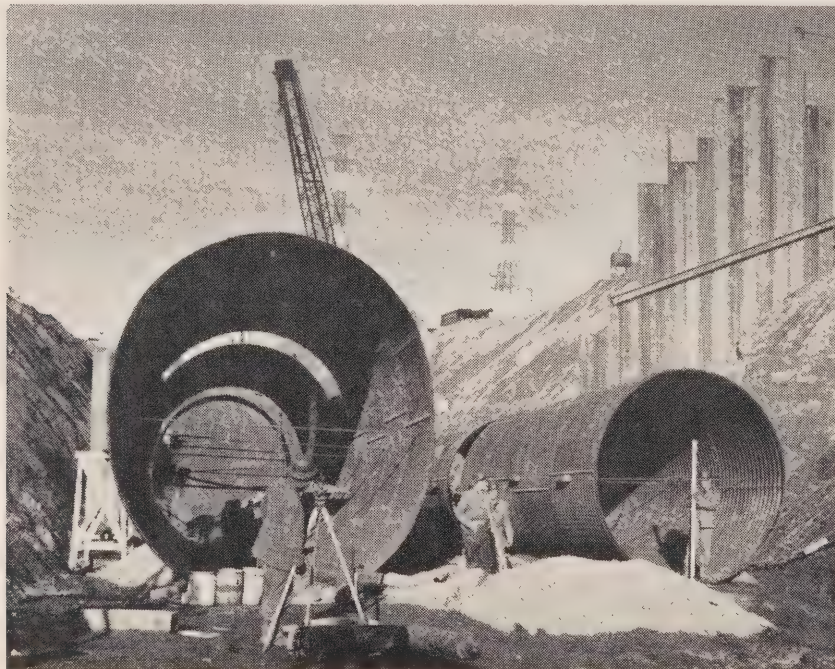
With nearly seven months' work completed on the Cornwall dyke, the outline of the broad base portion of the structure has become a familiar sight to motorists on No. 2 Highway, between Cornwall and Mille Roches.

When completed in 1957, the dyke will extend from the north end of the main power dam and generating stations in a northwesterly direction to the site of the present hamlet of Mille Roches. Approximately 3½ miles long, it will rise to a maximum height of 80 feet in some places and have a maximum width at the bottom of 460 feet.

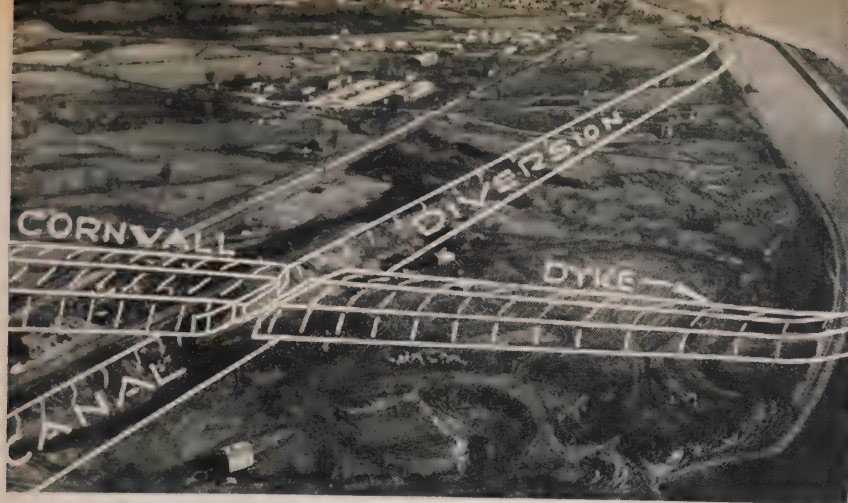
Construction of the dyke will require large quantities of material. It is estimated that some 4,900,000 cubic yards of compacted earth, sand and gravel fill will be used, also 330,000 cubic yards of "rip rap," a heavy stone used for protection against wave action along the water side of the dyke.

While dyke work is in progress, an Ontario Hydro technical group consisting of a divisional engineer, a resident soil engineer, a geologist,

STEEL liners are being placed in position for two new tunnels under the new channel of the Cornwall Canal. Equal in size to two other tunnels under the present canal, the passages will provide easy access to the Ontario Hydro powerhouse site for equipment and materials.







◁ MARKED photograph indicates the route of the Cornwall Canal after it is diverted and the position of the closure section of the Cornwall dyke. Excavation work for the new, 5,700-foot long channel is now in progress.



◁ TRAFFIC has been diverted from the Commission's powerhouse work area with the completion of a 7-mile section of new Ontario Highway No. 2 from Cornwall to Moulinette.

IROQUOIS is virtually the first Ontario community to feel the impressive impact of the seaway and power project as villagers' homes are moved from their riverfront location (background), to the site of the new village (centre). Excavation (foreground), indicates site of the new shopping centre.



and several technicians will carry out investigation work. They will check closely on all phases of dyke building, including soil conditions and compactions. Their work actually started more than two years before dyke construction began, studying soil foundation and materials to be used in the dyke.

One of the interesting features of this dyke is the great protection afforded. When tightly compacted, the dyke material will weigh 145 pounds per cubic foot. This compares favorably with concrete, which weighs 150 pounds per cubic foot. The dyke consists of five sections. With the Cornwall Canal diverted, construction of this section will be completed. Meanwhile, shipping will pass through a 50-foot gap left in the dyke. As soon as the locks

*(Continued on page 6)*





SITUATED in the project administration area, two miles west of Cornwall, Hydro's 30-bed hospital is designed to provide on-the-spot medical and surgical treatment for construction workers and staff members employed on the Ontario phase of the large power development.

and canals, being constructed between Barnhart Island and the United States mainland by the Saint Lawrence Seaway Development Corporation, are completed, steel gates will be dropped into the 50-foot gap to complete the line of the dyke and hold the water when the forebay level is raised.

When construction has advanced to the point where power can be generated, the gates of the Long Sault dam will be lowered, causing the water level to rise until a sufficient head of water is obtained to operate the turbines in the powerhouses.

Approximately 20,000 acres along a 35-mile stretch of the Canadian

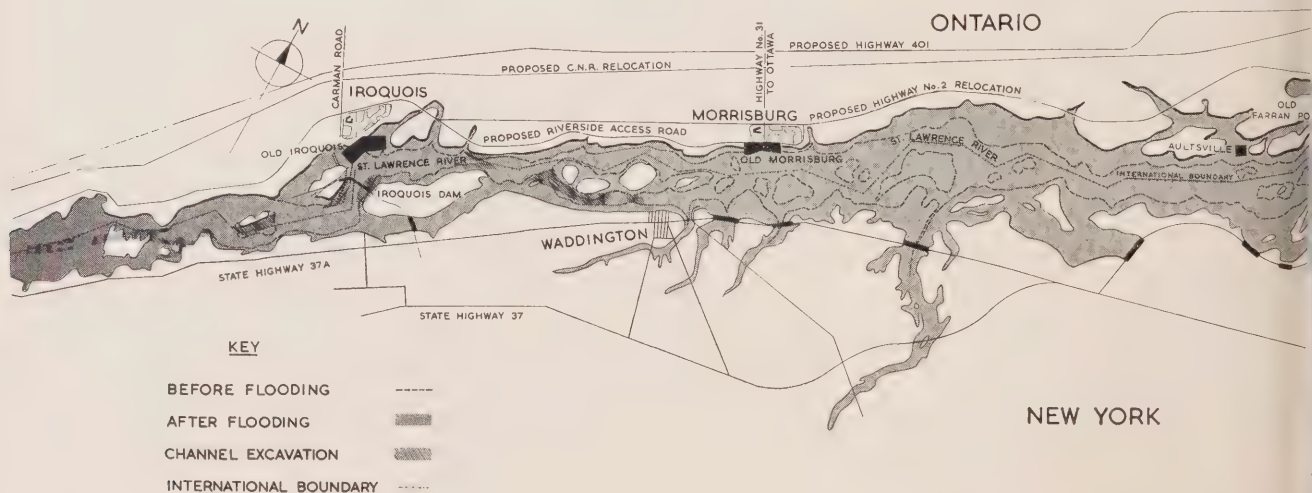
shore will be affected by the higher water level, involving some 6,500 people, including residents of the Villages of Iroquois, Aultsville, Farran's Point, Dickinsons Landing, Wales, Moulinette and Mille Roches and one-third of the town of Morrisburg. In addition, about 40 miles of main Canadian National Railways line between Cornwall and Cardinal is being relocated. Considerable progress has been recorded in recent months. Work is also under way on the relocation of some 35 miles of highway, with the section of Highway No. 2 from Cornwall to Moulinette now carrying traffic.

Elsewhere, improvement on 9-Mile Road has been completed and

track laying has been completed on the railroad siding extending for approximately 1¼ miles from the main line of the C.N.R. to the warehouse area near the Ontario powerhouse.

Rehabilitation plans call for the creation of three separate communities to replace those affected by the flooding and the reconstruction of Morrisburg, which will be partially inundated, on land still within the present corporate limits of the town. The new communities must be finished and occupied before the old villages and towns are dismantled.

Although major flooding will not take place until 1958, rehabilitation work and relocation work is already under way, particularly in the Iroquois area, where moving operations started on August 18. Houses are now being moved from the present-day Village of Iroquois to the new townsite, about 1½ miles back from the St. Lawrence riverfront, at the rate of approximately one a day. Residents of the villages of Aultsville, Farran's Point, Dickinsons Landing and Wales will find new homes in what is now known as New Town No. 1, just north of the relocated No. 2 Highway, about 12 miles west of Cornwall. Tenders have been called for construction of sewer mains and a sewage disposal plant for the new townsite. As for the villages of Moulinette and Mille Roches, they will be relocated in





the projected new Town No. 2, on No. 2 Highway, six miles west of Cornwall, and about a mile north-west of the present village of Moulinette. At the outset, the new town-site will provide accommodations for 1,600 persons, but there will be space for a population of 3,500 with the surrounding land well adapted for unlimited future expansion.

One important result of the overall rehabilitation proposals will be the fact that the residents of the new communities will have the most modern municipal services at their disposal. Because of the workable size of the new towns, it will be possible to incorporate the latest in town planning techniques, an important factor in making the new communities among the most up-to-date on the continent.

While on the subject of relocation, sportsmen and conservationists applauded the salvaging of fish in the section of the river, which was unwatered to permit construction of the two powerhouses "in the dry." Before the water was pumped out through 36-inch discharge pipe at the rate of 80,000 gallons a minute, officials of the Ontario Department of Lands and Forests and commercial fishermen from Kingston, Ontario, moved in and netted the fish between the cofferdam structures. Some 1,390 piscatorial prizes, ranging from maskinonge to sunfish, were transferred to open water upstream and downstream, while ap-

proximately 15,634 lbs. of other fish gathered in the salvage operation were dressed and marketed.

While preliminary and actual construction directly associated with the development itself has been progressing on a wide scale in recent months, considerable auxiliary building has been under way also.

This auxiliary construction has included a recently-completed work camp just east of the Ontario Hydro administration area. The camp, which may eventually house 1,000 men, was built by Iroquois Constructors Ltd., Toronto, a contracting firm engaged in the construction of Ontario Hydro's powerhouse. The work camp has its own sewage and water systems, while the buildings, all of which are prefabricated, are

located in an 800-square yard area. During 1955 also, a number of other special Ontario facilities, including a project office and field soils laboratory were completed.

Located in Hydro's project administration area, two miles west of Cornwall, off Highway No. 2, the Commission's new project hospital was officially opened on November 9. Host for the occasion was Dr. R. W. I. Urquhart, Ontario Hydro's Director of Medical Services. Special guests included several representatives of the medical profession who practice in Cornwall and other communities in the St. Lawrence area.

Built by Hydro to provide on-the-job medical service and surgical

*(Continued on page 8)*



INAUGURATED in August, 1954, the development is scheduled for initial operation in 1958. This dramatic concept shows the completed powerhouses and seaway canal as well as other important associated facilities.

MAP indicates location of railways, highways and new communities as well as the seaway and power structures on completion in 1960.

treatment for construction workers and staff members, the gleaming white structure has a 30-bed capacity and incorporates many of the latest facilities of larger institutions. The hospital is similar in design to those erected by the Commission during construction activity on the Ottawa River and at the site of the Sir Adam Beck-Niagara Generating Station No. 2. An important feature of Hydro project hospitals is that, in addition to providing facilities for immediate medical attention to injured and sick workers, they relieve the strain on local community hospitals.

In charge of the Hydro hospital is Dr. John A. McIntyre. On his staff, at the moment, are two registered nurses and five first-aid men, who also act as ambulance men. The two-storey frame building, with single-storey wings, is equipped to handle most accidental injuries and illness cases, which may occur during the construction period. The main floor of the hospital includes space for doctors' offices and examining rooms, an operating room, X-ray room, a small laboratory and dispensary, and an emergency room for first-aid cases. Single, double and four-patient rooms, a general ward for approximately 14 patients, and an isolation ward are also located on the ground floor.

The second floor of the building houses the hospital's nursing staff and includes single bedrooms for four nurses, a housekeeper's room, a living room and a sun deck. A nurses' call system to the nurses' station connects all rooms. Service rooms in the building include a servery and up-patients' dining room on the main floor and kitchenette for the nurses on the second floor.

The official opening of the hospital coincides with the increasing tempo of construction work on the St. Lawrence Power Project.

Another big project under way is the building of the St. Lawrence Transformer Station to replace the Cornwall T.S., which will also be in the path of the flooding waters. Construction of the first stage of

the new station is now more than 80 per cent complete.

The immense size of the St. Lawrence power project is revealed by the fact that about 2.7 million cubic yards of concrete will be needed for all structures on both sides of the river, requiring 1.7 million tons of sand and 2.7 million tons of stone.

In addition, 20,600 tons of structural steel and 20,200 tons of gates, hoists and cranes will be required. Excavations for the four principal structures will include 4,220,000 cubic yards of earth and 505,000

cubic yards of rock.

The vast construction job is changing the face of the river. But this is a river that has seen many changes. It has carried the explorers of old as they ventured westward in their frail craft toward the heart of the New World. Now it witnesses men and machines at work changing its historic contours to add to the electrical capacity of power-hungry Ontario. But the St. Lawrence continues inexorably toward the sea, mingling, as always, the past with the future. ■

## PROJECT EQUIVALENT TO LARGE INDUSTRY

*(Cornwall Standard Freeholder — December 21, 1955)*

Mr. William M. Hogg, Ontario Hydro's St. Lawrence project field engineer, had some interesting news for Cornwall and district residents when he spoke to a gathering of press and radio representatives from Eastern Ontario and Northern New York State Monday night. Among other things, Mr. Hogg disclosed that about 91 per cent of the laborers currently working on the project in this area have been recruited from Cornwall and the surrounding district. Close to 62 per cent of skilled project personnel also have been drawn from the local labor pool. When it is considered that some 2,700 workers are engaged on the project on this side of the river, the percentages given by Mr. Hogg become all the more impressive. The district's economy also is being stimulated substantially by the quarter-million dollar weekly payroll for project workers.

These statistics help to place project construction work in its proper perspective in relation to the period of prosperity being enjoyed not only locally but elsewhere in Ontario and Canada as a whole. Certainly the number of men currently employed on the power development adds up to the labor demands of a large and substantial industry. And most of that industry is located in the immediate Cornwall area, although various project phases are being carried out between here and Prescott. The work, according to Mr. Hogg, is on schedule and is scheduled to increase during 1956, when full-scale construction of the Barnhart powerhouse and dam will be under way. Several thousand more workers will be added to the present labor force next spring and summer, thus widening the scope of this major industry operated in the Cornwall-Iroquois-Prescott sector.

Development of the river's power resources therefore has proved a vital factor in the boom conditions experienced on both sides of the St. Lawrence. Massena's prosperity is said to have reached a high level as a direct result of both power project and seaway construction work. What will come afterwards for Massena and Cornwall remains for the future to determine. But during the next two or three years at least both communities should prosper as never before, even though this may involve many problems such as adequate housing, civic services, educational facilities, etc.



# ENTHUSIASTIC AUDIENCE

## DISTRICT 5 O.M.E.A. DELEGATES

### NAME W. B. ELLIOTT AS PRESIDENT

WITH a large and enthusiastic audience on hand, the annual meeting of District No. 5, O.M.E.A., was held at Vineland. In welcoming the delegates, Thomas Barnes, Niagara Falls, the retiring President, emphasized the importance of maintaining a continued interest in Hydro operations across the province. He reminded delegates that public ownership necessitates a well-managed operation. It is imperative, therefore, that elected representatives take their obligations seriously, serving their communities fearlessly and honestly.

A. A. Kennedy, brought greetings from the parent body of the O.M.E.A., of which he is President, and from Ontario Hydro, of which he is a Commissioner.

During the course of the meetings, several important questions were discussed, including the pooling of 115 kv. transmission. After hearing a prepared brief on this subject, the meeting adopted a resolution moved by W. B. Elliott, St. Catharines, requesting re-consideration of the Commission's action in changing the basis of costing power and also requesting a statement from Ontario Hydro as to their plans regarding equalization of rates and that the municipalities be consulted before making any changes in the method of costing power.

### Request Special Committee

Another subject dealt with concerned the method of representation in the O.M.E.A. Following a lengthy discussion, it was moved by Fred Cavers, St. Catharines, and adopted



W. S. PETTIT, Brantford, left, appears to be making his point with this group, which includes, left to right: Roy Pierson, George Unger, Brantford Township; Norman Grandfield, Brantford, and Samuel Murchie, Brantford Township. Mr. Unger retired at the end of 1955.



MEMBERS of the 1956-57 executive — front row, left to right: C. R. Buss, Thorold; W. B. Elliott, St. Catharines, President; Thomas Barnes, Niagara Falls; Roy Pierson, Brantford Township; second row, left to right: Frank Kaupp, Merriton; Ray Pfaff, St. Catharines, Secretary-Treasurer, and Harold Schneider, Port Dover. G. L. Foulds, Paris, and Cecil Swayze, Welland, were also elected District Directors but were not present when this photo was taken.

by the meeting that: "We request the O.M.E.A. to appoint a special committee, comprised of the O.M.E.A. President and the District Presidents and one other representative of each District, to review the methods of representation and voting in the O.M.E.A. with a view to revising the constitution to provide

greater equity of representation, this to be presented at the convention in 1957 or earlier."

The election of officers for the year resulted in the naming of W. B. Elliott, St. Catharines, as President. C. R. Buss, Thorold, as First Vice-President, and Roy Pierson, Brant-

*(Continued on page 25)*



# BRIGHTEST EVER

CANADIANS bought an estimated 27½ million colored Christmas bulbs in 1955. Actual figures for the district aren't available at the moment, but citizens and business representatives of Metropolitan Toronto are taking wagers that this area used at least two million of these lights in the spectacular Yuletide decorations, which graced private residences as well as commercial and industrial buildings during the recent festive season.

So colorful was the display of Christmas lights that the Toronto Transit Commission organized "Xmas Light Tours" through some of the best lighted and decorated districts.

The bus tours attracted record business for the third year. During the 12 nights from December 19 to 30, a total of 5,732 people were carried on 168 special busses, December 28 proving the peak night when 35 busses carried 1,200 sight-seeing passengers over the 35-mile tour route. Even on Christmas "night," when people are apt to remain at home, 144 people made the tour on five busses. Interest was maintained right to the last tour on December 30 when 793 people made the trip on 24 "specials."

It may be conservatively estimated that, including private tours, at least half a million people viewed the colorful Christmas decorations that made a brighter Metropolitan Toronto.

While some residents contented themselves with a simple string of lights around the main door, others carried the lights to the windows as well, while the more ambitious

strung them along the eaves, outlining their homes with the varicolored bulbs.

While parlors, living rooms — or dens in some cases — maintained their traditional Christmas atmosphere with huge, lighted flora specimens, Toronto householders — by the hundreds — also decorated their verandahs and lawns. Small and large fir trees, perched in strategic locations, brightened the darkness with their illuminated festoons. Those home-owners, fortunate enough to have growing shrubs and trees on their lawns or along their driveways, also included them in their decoration schemes.

## Novelty Decorations

Supplementing the dazzling arrays of lights, were such novelty decorations as illuminated snowmen lending their color to gardens, lawns and windows, while giant candles with simulated electric flames guarded and brightened the entrances to many homes.

Santa and his reindeer were much in evidence too, some even approaching the stature and famed girth of this much-beloved character. One original decoration caused amusement — Santa going head-first down a real chimney — only his red-clad legs being silhouetted above the rooftop.

Literally dozens of lamps were used to decorate a home in the Kingsway district. They garlanded doors, windows and eaves, decked a huge Christmas tree and many shrubs throughout the grounds as well as a low stone wall, while cheery "GREETINGS" were extended to passing motorists and

pedestrians by large illuminated letters.

Metropolitan Toronto's spectacular Yule display makes the "trade" statistics easy to understand. Dealers estimate that sales in Canada of Christmas tree lights and decorations reached \$6 million in 1955. They reported a strong demand for tree lights and other standard indoor items and an increasing use of outdoor lighting displays.

Four-foot snowmen, three-foot high candles and five-foot Santa replicas, retailing at \$100, proved popular, while the demand for rooftop Santa Claus-and-sleigh combinations reached such proportions that one wholesaler supplier sold out several weeks before Christmas. Strings of flashing, clear bulbs, which give a twinkling, starlight effect were said to be growing in favor.

## Sales Increase

A leading manufacturer reported that sales of indoor and outdoor Christmas lamps in Canada have increased by 65 per cent over the past two years — from 16½ million in 1953 to more than 27 million for 1955 — an average of nearly two lamps for every man, woman and child in the Dominion. Sales of 5½ million outdoor lamps throughout the nation last year represent an increase of some 57 per cent since 1953.

The brighter trend is attributed to continuing prosperity and a growing appreciation of the cheerful and novel effects of Christmas lighting. It is also felt that only in recent years has the householder become accustomed to switching on all the





▷ TORONTO'S famed Hospital for Sick Children on University Avenue drew favorable comments with its Christmas decoration scheme.



FLOODLIGHTING, supplemented by large electric candles, colored bulbs and an illuminated greeting made this Toronto home a virtual "showplace" for Christmas "tourists."



lamps, following restrictions in power use during and immediately after the war.

The growing interest in these colorful displays is also manifested by the sponsorship of lighting and decorating contests by boards of trade, chambers of commerce and service clubs in a number of communities throughout the province, and the surprisingly large number of entries in the *Toronto Daily Star's* Christmas Lighting and Decorating Contest.

Photographic entries came from many municipalities as widely separated as Timmins, Napanee and Kincardine. Another surprise to the sponsors was that 80 per cent of the entries recommended that other homes be considered for judging, only 20 per cent of the competitors

(Continued on page 12)



COMMERCIAL premises in many sections of the Toronto area added a festive touch to the season with mammoth, roof-top displays. ▷







△  
INTEREST in the colorful decoration schemes was evidenced by the fact that more than 5,000 persons took the "Xmas Light Tours," sponsored by the Toronto Transit Commission.

asking that their own homes be inspected. The Toronto Star contest included three classifications: Homes of not more than six rooms; eight-room houses and homes with more than eight rooms.

Interestingly enough, the Star's panel of judges consisted of: Hedley F. Davidson, Supervising Engineer of the Illumination Section in Ontario Hydro's Research Division; John C. Parkin, of John B. Parkin Associates, Toronto architects, and A. G. Mackie, President of the Advertising and Sales Club of Toronto and Public Relations Director of the Abitibi Power and Paper Company.

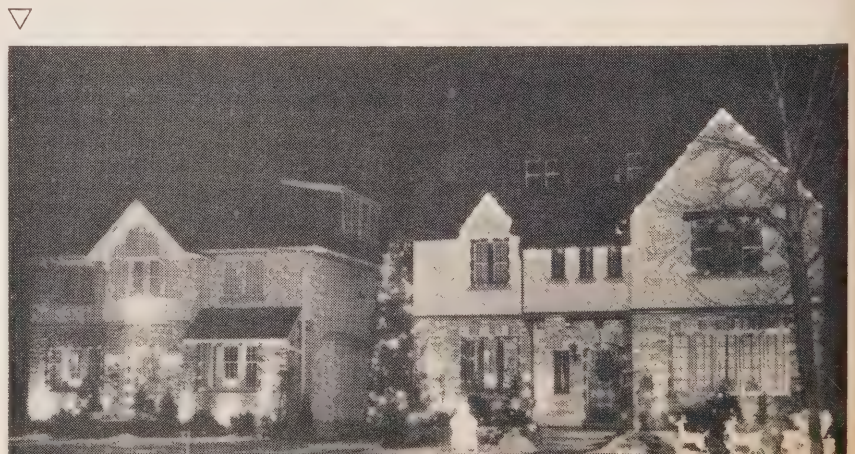
There were many recommendations that judges should see decorations not within the scope of the contest, such as windows in apartment buildings, duplexes and business and commercial premises. As a result, the sponsors of the contest are to consider increasing its scope during next Christmas season.

*by Frank C. Wood*



△  
VISITORS had little difficulty in finding their way to this attractive Toronto home with its bedecked, living "Yule" tree, brilliant lawn decorations, and colored lights around the eaves.

APPARENTLY these two Toronto home-owners were running a friendly contest to "outshine" each other, the householder on the right gaining a slight edge on his neighbor by adding an illuminated Santa Claus and reindeer as well as a life-size snowman near the main entrance.





# PHENOMENAL INCREASE

## ONTARIO HYDRO TO ENLARGE NEW NIAGARA AND TORONTO PLANTS

FACED with rapidly rising demands for power which, in 1955, in its Southern Ontario System, increased some 14 per cent over 1954 — more than double the average annual long-term rate of growth — Ontario Hydro will go ahead immediately with plans to enlarge two of its major generating stations. Announcing this recently, Hydro Chairman Richard L. Hearn stated that the Commission's estimates of load increases are related to the long-term rate of growth in requirements on the Southern Ontario System, which from 1922-1955 had equalled 6.1 per cent per year. For the period 1950-1955 alone, the rate of increase had jumped to 8.5 per cent a year.

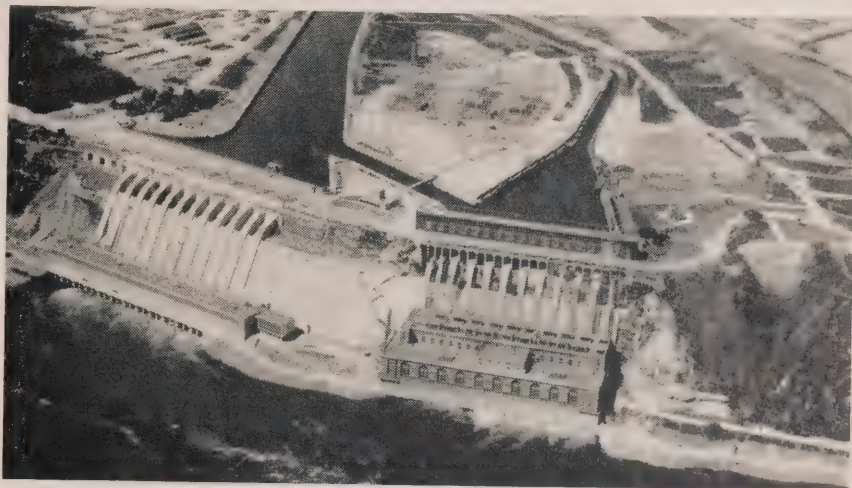
As a further protection to the people of the province in the matter of power supply, the Hydro Chairman stated that the Commission's plans call for the installation of two additional 75,000-kilowatt units at the new Sir Adam Beck-Niagara Generating Station No. 2 and one 200,000-kilowatt unit at the Richard L. Hearn steam station on the Toronto waterfront.

Work will start almost immediately on these units, to be installed and incorporated into the Commission's Southern Ontario System. The two at the Niagara plant are scheduled for completion in time to meet the 1957 peak demand for power, while the unit at the Toronto Station is scheduled for service to meet the 1958 peak demand.

ADDITION of a fifth unit at the Richard L. Hearn station, Toronto (already Canada's largest steam generating station), will bring the installed capacity up to 600,000 kw.



OFFICIALLY opened in 1954, the Sir Adam Beck-Niagara Generating Station No. 2 has 12 units in service at present. Installation of the 13th and 14th units will also include work which can be carried out for the ultimate installation of the 15th and 16th units (extreme left).



These three units combined will provide a total additional installed capacity of 350,000 kilowatts—equal to about 90 per cent of the present capacity of the Richard L. Hearn plant, which is the largest steam generating station in Canada.

Drawing attention to the continued upswing in Ontario's economic and industrial life, which has resulted in sharp increases in load growth, the Chairman stated that these rapidly changing conditions have made it necessary for the commission to revise previous estimates of load growth for future years. "It is now apparent," Dr. Hearn observ-

ed, "that additional capacity will be required to provide a reasonable reserve in 1957 and 1958 to take care of such contingencies as low water conditions, breakdown of equipment and abnormal load growth."

It could be assumed, Dr. Hearn added, that load growth for the next two or three years will be at least equal to the long-term rate and could easily equal that experienced over the past five years. On the basis of the latter assumption, power requirements by 1958 will be in the order of 4,537,000 kilowatts.

*Continued on page 21*

# LOOKING AT LISTOWEL

Busy Town Combines Old-Fashioned

Courtesy With Modern Enterprise

By Horace Brown



**F**RIENDLY citizens make a friendly town.

Thus it is with Listowel. A walk down its main street by a stranger is made to the accompaniment of smiles and cheery greetings. These gestures are all the more warming for their obvious spontaneity.

It was not always this way with Listowel. When John Binning first came to the locality in 1852, there was nothing to greet him but the vast, whispering silence of the forest wilderness. It is said that the hardy pioneer had a habit of climbing the highest tree on a hill to sit at its top and wish some human being would happen along to break the monotony of his utter loneliness.

John Binning would not be lonely in Listowel today. He would find, instead, a bustling, modern town that still somehow retains a charm of less-hurried days. Situated at the junction of Highways 86 and 23, it is the home of 3,477 citizens, who would be only too glad to shake his

hand and bid him welcome. He would see, where once he tracked animals for food, fine homes and busy industries set in the heart of prosperous farmland.

He would find, too, that Listowel has given many illustrious citizens to Canada and to the world... a little lady, who founded the Junior Red Cross; scientists; one of the great flying aces of World War I; a hockey player whose deeds are already enshrined in hockey's Hall of Fame; an Olympic champion; members of Parliament and businessmen whose names are known from coast-to-coast.

Listowel's founder would no doubt be amazed and bewildered by the size and scope of industry that has grown up in the town: a furniture factory; a factory for spinning and dyeing yarns; a cloth manufacturer; a casket factory; feed mills; a produce distributor... among others. The modern houses sitting side-by-side with the stately homes of yesterday and the new subdivisions that reflect growth and progress, would assure him that today's citizens know

how to live well. The fine memorial arena, the spacious and well-equipped parks and the splendid churches, schools and library would assure him that Listowel's spiritual, educational, cultural and recreational needs are being met more than adequately. The town's main street, with its busy commercial establishments, would impress upon him how times have changed from his day, when food and clothes were obtained by the gun and the plow.

Of all the amazing scenes the first settler's eyes would encounter, perhaps the one that would make the deepest impression would be electricity. He would see the wonders this genie gives to modern Listowel and they would be beyond the comprehension of a man who lit a tallow candle to beat back some of the enveloping darkness of the wilderness into which he had come. He would see the lumber fashioned into some of the finest furniture on the continent by electrically-powered machines and he would, undoubtedly, recall, with a slight twinge of nostalgia and a more pronounced twinge







CHILDREN at play in the autumn leaves of Listowel Memorial Park, a familiar and delightful rendezvous for citizens and visitors alike.

of pain, how his muscles ached after he had laboriously felled a tree and fashioned it into useful but crude tables and benches and utensils. John Binning would see with a clear eye how communities like Listowel have come to depend for their very existence . . . their comfort, safety, and livelihood . . . upon a steady flow of power. He would be glad to meet the men of the Listowel Public Utilities Commission and would recognize instantly that they have not lost the pioneering spirit, but have channelled it into new and even greater efforts on behalf of their fellow-citizens.

There would be much to learn about Listowel, but there would be one thing John Binning would recognize instantly: that he was among friends in a friendly town.

#### First Settler

Although not actually the first white man to come to the district, John Binning is recognized as the first settler on land that was to become part of Listowel. When he

*(Continued on page 16)*



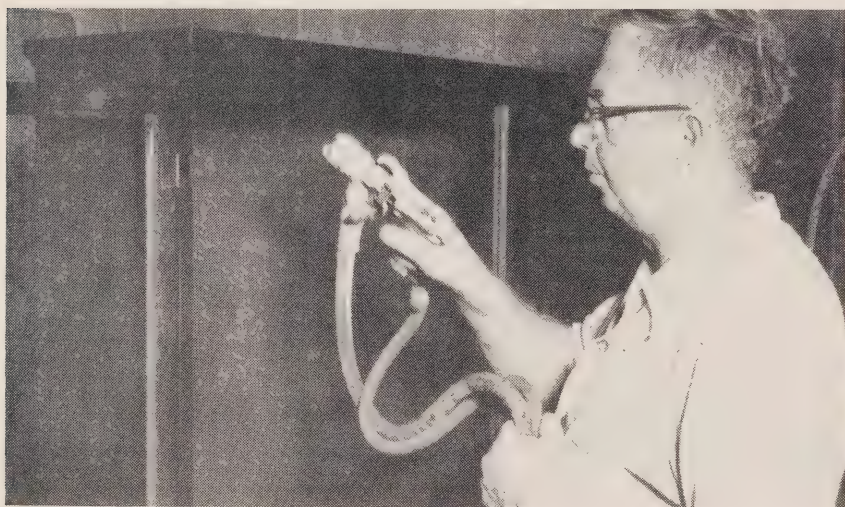
REPRESENTING the residential architecture of two periods are the attractive Listowel homes of L. R. Cole (foreground), Mayor George Leith (background), in the lower photograph, and the stately, colonnaded home of J. B. Hay in the photo on the right.







ONE of the town's newest industries, Spinrite Yarns and Dyers Limited is said to have the largest staff of any Listowel factory. Here Jean Cooper operates a Bradford spinning frame.



VARNISHING with a compressed-air sprayer is a simple job for this technician in the Andrew Malcolm Furniture Co. plant at Listowel, which has been operating continuously since 1867.



RECENTLY elected as Listowel's Mayor, George Leith watches as his daughter, Betty, grades an egg with a sealed-beam candler in the Listowel Produce Company. Mr. Leith established this flourishing business in 1937.

gave up his small business on the mountain near the present site of Dundas, Ont., the pioneer was looking for a place where he could settle his family and begin a new life. After beating his way through the Queen's bush for days, he came to an abandoned, half-finished shack.

John Binning was an honest man. He set out to find the owner of the shack. Following trails and tracks through the bush, he came to a cabin near what is now Palmerston, owned by a hunter named Henry. Henry acknowledged ownership of the unfinished cabin and the land. On birch bark, with the charred point of a stick, Henry inscribed his acknowledgement of the sale. The hunter pressed too heavily on the charred point, breaking it, leaving nothing but a legal smudge to indicate possession of what was to be a large portion of the present Listowel.

The pioneer and his hardy family were not to be long alone. By 1866, 12 years after the Binnings settled in the completed shack and began clearing the land, they had 800 neighbors and the hamlet became a village under the jurisdiction of the Township of Elmira. John Binning, of Somerset, England, erstwhile British soldier, had founded a community. He established Listowel's reputation for friendliness and kindness by his own example and served on the township council and the first school board.

When it came to naming the new community, the decision was to call it "Mapleton." However, there were already two Mapletons, so another name had to be found to avoid postal confusion. Mrs. W. H. Hackling, wife of the municipality's postmaster at the time, had been born in Listowel, Ireland, and so the name of "Listowel" was chosen.



With its wide, clean streets, lined with maple trees that interlace in a canopy, and its fine, well-kept homes, Listowel holds, and not without merit, that it is one of the most beautiful towns in Ontario. It is located in the centre of a thriving agricultural district, noted for excellent cheese, which has attained international fame.

Synonymous with the growth of Listowel has been the expansion of its electrical services. When the first Listowel Light and Water Commission was formed in 1915, it signed a contract with Ontario Hydro for the delivery of power. Since the first power was delivered in 1916,

the load has increased from 100 kilowatts in 1916 to 2,200 kw. in 1954.

The first commission consisted of Mayor A. W. Featherstone, who served as Chairman, with C. Prueter, Robert Oliver, A. E. Malcolm and S. L. Adolph as commissioners.

#### Listowel P.U.C.

Today, the Listowel Public Utilities Commission houses its Hydro and water services in one building at the edge of town, with its offices on Main Street. It has more than seven miles of transmission line, serving 1,108 domestic customers, 202 commercial customers and 34 in-

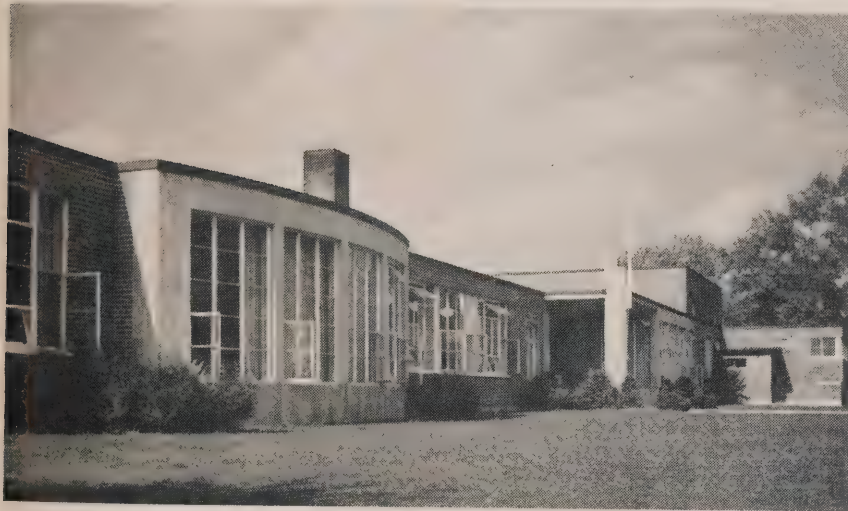
dustrial customers, and owns one substation.

The present Listowel P.U.C. comprises Chairman Adam D. Park, Commissioners John McMichael, Thomas J. Moffat, Mayor George Leith and E. M. Creighton. The latter-named has been on the Commission for a quarter of a century. Miss Muriel Hammond is Secretary-Treasurer. R. B. Hanna has been Manager of the P.U.C. for 34 years. As one travels about Listowel, it becomes evident that "Bob" Hanna, by his years of faithful service, has become "Mr. Listowel" to its citizens. He was honored in 1954, when the town's newly-purchased substation was named in his honor.

Rural counterpart of the town's public utilities is Ontario Hydro's Listowel Rural Operating Area, under its Manager for the past nine years, J. D. (Jack) Hood, a member of Hydro's Quarter-Century Club, who was celebrating his 60th birthday, when *Ontario Hydro News* visited him on October 6. With headquarters in the former C.P.R. station building at Listowel, the area has some 600 miles of rural primary line, a transformer station at Palmerston, and eight distribution stations. With 35 employees, including a line crew of 20 and a forestry crew of eight, it serves 2,441 farm, 616 hamlet, 298 commercial, 10 industrial and two summer customers over an area of approximately 150 square miles. One of the largest operating areas in the province, it employs five trucks, two of them radio-equipped.

The Listowel P.U.C. must be constantly "on its toes" to meet the power demands of its customers, particularly the rapidly-expanding industries. As seems to be the trend in many southern Ontario towns, the executives of these industries are mainly young men, who believe in employing the latest electrically-

(Continued on page 18)



△ CITIZENS are proud of the town's fine educational facilities, particularly the modern Listowel District High School, which provides secondary training for approximately 475 pupils.



△ ONE of Listowel's foremost citizens is Miss Adelaide Clayton, who founded the Junior Red Cross Society. She is displaying the medal she received for this achievement.





MEMBERS of the Listowel Commission, left to right: T. J. Moffat, President of District 6 O.M.E.A., John McMichael, R. B. Hanna, Manager, Adam D. Park, Miss Muriel Hammond, Secretary-Treasurer, and E. M. Creighton, who is observing his 25th year as commissioner.



A LOCAL landmark is the town's pumping station and the R. B. Hanna Substation, both owned and operated by the Listowel utility. The substation was named in honor of Manager Hanna.

operated machinery and methods in their various enterprises.

One of the newest firms is also accorded the position of the largest employer of labor in Listowel. This is Spinrite Yarns and Dyers Limited, which started business on September 8, 1952, when it took over the physical assets of the former Maitland Spinning Mills. Already it is regarded as one of the best-equipped worsted and woollen spinning mills in Canada. Yarn manufactured within its walls is shipped to all

parts of Canada, being used in many phases of textile production, mainly men's and ladies' fine-knitted outerwear and men's underwear and socks, or for hand-knitting in the home. Spinrite commenced operations with less than 50 employees three years ago, but its steady growth has brought it rapidly to the point where it now has more than 125 full-time employees, with additional part-time help required during its busy seasons. The plant occupies two large brick buildings, with a total

of 115,000 square feet of floor space.

Guiding the destinies of this expanding industry is David D. Hay, 44, President, who is a former Toronto dyestuff company executive. Mr. Hay started as a dyer's assistant, and became foreman of the dye house, before buying out the Maitland Mills, which had been operating at that site for 33 years. Don McLaren, Secretary of the firm, is only 27.

### Electric Machines

Every machine in the plant is electrically-operated, although, of course, nothing can replace the skill and brains of men like the dyers, who must spend years to learn their intricate trade. Every batch is dyed to its own formula and these formulae are closely-guarded trade secrets.

When the wool comes into the plant, it is laid out and put through two electrically-operated pickers (each is operated by a 20-horsepower motor) that break up and block the wool. An electric blower system feeds the wool to any one of six carding machines, which occupy the length of one section of the 300-foot long building. These machines and other machines in the factory are repaired in the plant's own electric workshop.

The all-electric dye house is a fascinating place. After dipping the carded wool in huge vats containing the formula dye, the residue of color is extracted by power extractors and the dyed wool is dried in electric driers for 20 minutes. Every machine is automatically-controlled so that the master dyers have the entire process at their fingertips. When wool has been properly dyed, the solution that is left is just barely tinted, indicating that all the color has gone into the material. Temperature is under constant thermostat control as a vital part of the operation. A scouring machine takes out excess oils from the wool.

The only furniture company in Canada operated by the fourth generation of the founder's family is



Listowel's Andrew Malcolm Furniture Company, whose "No-Mar" trademark has become famous since its adoption in 1932. Managing Director of the company is 40-year old Andrew Malcolm III, who took over operation of the complex organization at the age of 25. There is an Andrew Malcolm IV, aged 12, who gives considerable evidence already of following in the footsteps of his namesakes. Harold Winslow is the Manager of the company and the Assistant Managing Director is another Malcolm, 37-year old George.

Founded in the year of Canada's Confederation, 1867, the business occupies 90,000 square feet of space in its head office and main plant at Listowel, built in 1912. The company also operates a branch at Kincardine, where it got its start. It manufactures bedroom and dining-room suites, known in the trade as "case goods," and is said to be the second largest furniture plant in the province. The Malcolms are proud of the fact that, except for normal holidays, the building has not been closed in all its long history.

The factory uses a million board feet of lumber a year . . . hardwood, maple, elm, basswood, beech. With the emphasis on quality, it turns out about a thousand suites in that period.

Electricity is the keystone upon which the modern Malcolm business is built. There are planers and sanders that use plenty of kilowatts, but the most amazing machine is the \$30,000 electric double-end tenoner, which has no less than 14 motors, ranging from 1½ to 10 horsepower. This machine is a factory in itself, which could conceivably make a bedroom suite after the rough work has been completed. It eliminates four operations of stripping and joining. One of the highlights of this machine, as far as the Malcolms are concerned, is that the man who operates the tenoner for them, Lloyd Orth, invented an improvement for which the manufacturers gladly paid patent rights. Lloyd boasts that the

machine does the work of at least 10 men.

The Imperial Cloth Company, a subsidiary of the Circle-Bar Knitting Company, Kincardine, is managed by another 40-year old, Nowell Porritt. The company occupies 30,000 square feet of what was previously a weaving mill and has 56 employees. It prepares suitings, woollens and worsted cloth that are made up into articles of clothing for men, women, and children by Toronto and Montreal cloak-and-suit manufacturers. Like other Listowel industries, it reports that business is quite brisk. The company processes right from the wool, importing its worsted yarn. While it does its own piece-dyeing, its stock dyeing is mainly done by Spinrite Yarns, an example of community cooperation. Although its 30 weaving machines, operated by women who take a three-month training period, make a seemingly terrific racket, the operators go unconcerned about their work. It also has a warping machine that makes 200,000 yards of material in a year. All the machines, like those of the other factories, are electrically-operated.

### Company Loads

In fact, it was stated in each factory that, if the power should go off, the plants would have to shut down. Perhaps this can be best illustrated by stating that the loads of the various industries mentioned are recognized as heavy loads for a medium-sized town.

Among the industries is one that throws light on the reason for the growth of this progressive community. This is the Listowel Produce Company, owned and managed by Listowel's new mayor, George Leith, with the assistance of the rest of the Leith family and some 16 employees. Founded in 1937, the company moved into its new building in 1944 and hums briskly in every square foot of the 10,000 it occupies.

The Listowel Produce Company handles eggs, poultry and commercial feed, buying within a radius of 50 miles of the town, and shipping to points as far away as the United States and Venezuela. The South American country gets Listowel eggs in oil. The company's six trucks, ranging from 2-ton to 10-ton, deliver refrigerated fresh eggs to Montreal, Buffalo, Toronto and Detroit. Up to 3,000 cases of eggs are shipped a week, each case containing 30 dozen. It also buys, kills and prepares on an electric "assembly-line" 3,000 New York-dressed poultry a week. Twelve tons of commercial feed are sold weekly to district farmers. Besides its poultry-killing and cleaning and packing plant, which depends upon electricity, the Leith enterprise uses a sealed-beam candle.

It has been said that, if a man is to be known by the company he keeps, a community can be tabbed by the citizens it produces. In that case, Listowel has earned a proud place in the Canadian scene. Some of its sons and daughters are world-renowned for the contributions to the arts, sciences and athletics.

Perhaps Listowel's best-known present-day citizen is a little lady who is more than 80 years young. She is Miss Adelaide H. Clayton, B.A., who is credited officially with having founded the world-wide Junior Red Cross Society, which has

had a great humanitarian effect upon many nations. Miss Clayton had the idea, while teaching at St. Marys, Ont., during the Boer War, that her pupils would like to provide comforts for the soldiers through the Red Cross

Society. So she formed her school-girls into an organization called the "Maple Leaves," and some \$354 was raised to forward to Canadian Red Cross headquarters. Out of this small beginning came the formation of the Junior Red Cross Society, the  
(Continued on page 20)



largest youth organization in the world. Adelaide Clayton's role as creator of that body was officially recognized at the Red Cross annual meeting of March 7, 1940, when she was called to Toronto and presented by the Lieut. Governor, Hon. Albert Matthews, with a medal commemorating her work and a life membership in the Canadian Red Cross Society.

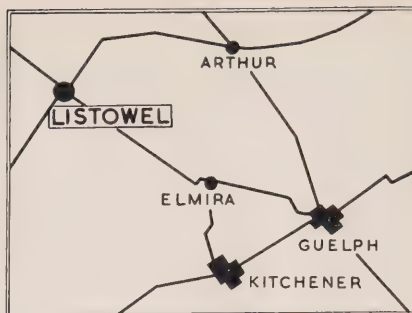
### 12th Arts Graduate

Adelaide Clayton has other claims to fame. When she received her Bachelor of Arts degree in 1889 from the University of Toronto, she was the 12th woman in Canada to achieve this distinction. Miss Clayton was the first lady teacher at St. Marys High School and one of her pupils by the name of Meighen, later made quite a mark as the Rt. Hon. Arthur Meighen, Prime Minister of Canada. In the early days, Miss Clayton took an interest in the formation of Women's Institutes and was one of the early speakers on this subject in the province.

Visitors to the new auditorium of the Sault Ste. Marie Collegiate Institute will find that it is called "Clayton Auditorium." Further enquiry will elicit the information that it was so named in honor of Miss Vivian Clayton, Adelaide's sister, who was long a highly-respected teacher there.

Now the two sisters have retired to their charming home in Listowel. But they are seldom alone, for their wit and charm and clear-thinking on a variety of subjects bring a daily stream of visitors to their hospitable doors.

During World War I, the name of a Listowel man was on the lips of every Canadian. This was Major Andrew Edward McKeever, D.S.O., M.C., D.F.C., Croix de Guerre Fr., Croix de Guerre, S.C., one of the great flying aces of that earlier conflict, who was credited with shooting down 30 official and 48 unofficial planes. A plaque to his memory, together with the Lewis gun he used in his 'plane, are hung



in the officers' mess of the handsome Armouries, just outside Listowel, headquarters of the 100th Battery, 21st Field Regiment, R.C.A.

Several noted athletes have also called Listowel their home. Fred (Cyclone) Taylor, whose deeds with a hockey stick have elevated him to the hockey Hall of Fame, is one. Another is Calvin Bricker, who is the only Canadian to ever win two prizes at one Olympiad. Competing in the 1912 Olympics in the running broad jump and the hurdles. Calvin took second place in each. He still holds the Canadian records for the hop, skip and jump and the high hurdles.

The late Listowel-born Horatio Walker was one of the most famous artists Canada ever produced. Even in his lifetime, his paintings sold for as high as \$30,000 apiece and his work will be found in all the famous art galleries around the globe. Mr. Walker studied in world capitals and was something of a mystery man, who hated the noise of cities. To get away from the clatter, he established a home on the Ile d'Orleans, an island in the middle of the St. Lawrence River near Quebec City. To Horatio Walker, "moderns" were anathema, and his motto was "Paint things as you see them, and see them straight." He was considered by many leading critics to be a master artist, far ahead of many of his contemporaries in "technique, conception and sheer artistry."

Recently, Listowel honored this famous son. A plaque in his memory was dedicated in the town's library, one of the first Carnegie Libraries in this country.

### Noted Surgeon

Two names stand out in Listowel's contribution to science. Dr. Austin Birrell Schinbein, a member of a pioneer Listowel family, was for 40 years a well-known Vancouver surgeon. A gold medallist of the University of Toronto, he was able to write after his name: "O.B.E., M.B., F.R.C.S., F.A.C.S." Dr. Schinbein, who died in Boston in 1950, was a member of the Senate of the University of British Columbia and a regent of the American College of Surgeons.

Another noted scientific Listowelite is Dr. Peter Heinbecker, a world-renowned authority on the Eskimos and on Arctic flora. A gold medallist of McGill University, Dr. Heinbecker is on the staff of the University of St. Louis, Missouri.

The late R. K. Hall, of Listowel, was author and co-author of many English text-books used in the schools of the country. Much of his fiction and articles appeared in leading publications and he was editor of the *Courier*, official publication for Ontario's teachers.

Other noted Listowel-born men and women, to name only a few, who have made their marks in the world are: Mrs. Mary (Marks) Raal, head of the Micro-Analysis Department of the Council of Scientific and Industrial Research at Pretoria, South Africa; George Schell, Vice-President of Canada Packers Ltd.; James Nicol, well-known newspaperman; Dr. Clarkson Long, President of the Medical Council of the State of Michigan; Graham and Jack Walter, Olympic contenders, and many others too numerous to mention.

Listowel is extremely proud of its modern recreation centre, its illuminated ball park, its golf course, and its tennis courts and bowling greens. The three lovely parks, Memorial, Livingstone and Jacksonville, are favorite rendezvous for all ages. A new, restricted residential area.

(Continued on page 25)



## PHENOMENAL INCREASE

(Continued from page 13)

While resources already scheduled for service by that year, which includes the first power from the St. Lawrence Power Project could provide a possible 4,546,000 kilowatts under dependable stream flow conditions, this would leave a surplus of only 9,000 kilowatts to meet such contingencies as low water conditions, breakdown of equipment and abnormal load growth. While some assistance would probably be forthcoming from neighbouring utilities, with which Ontario Hydro is interconnected in emergencies, it is still necessary for the Commission to provide reserve capacity of its own to cope with possible contingencies.

On the basis of the 1950-1955 rate of growth continuing, the additional capacity from the new units at Toronto and Niagara Falls would result in an estimated system reserve in 1958 of 8 per cent or approximately 358,000 kilowatts.

In building the Sir Adam Beck-Niagara Generating Station No. 2, which was officially opened in 1954 and which is one of the largest plants of its kind in operation in the world, provision was made for four units to be added to the 12 now in service. In going ahead now with the installation of the 13th and 14th units, the Commission will include work, which can be done most economically at this time, to provide for the ultimate installation of the 15th and 16th units.

Likewise, when building the Richard L. Hearn station in Toronto, Ontario Hydro made provision for the installation of additional capacity. The present installation at this plant consists of four 100,000-kilowatt steam-turbine generator units. The addition of the new fifth unit will bring the installed capacity up to 600,000 kilowatts and provision has been made for further expansion. ■



BEFORE

## WATERLOO INAUGURATES ITS "GREAT WHITE WAY"

**T**hese comparative views of King Street, Waterloo's main thoroughfare, demonstrate the effect of the new \$25,000 streetlighting system inaugurated recently. When the lighting system shown above was placed in service 45 years ago, Waterloo was said to have the best lighted main street of any municipality in Canada. With the introduction of 52 new fluorescent fixtures, lower photograph, a few weeks ago, Waterloo citizens proudly proclaimed that they had stepped back into that position. For citizens like Eby Rush, retired Superintendent of Waterloo P.U.C., it brought back many memories, for Mr. Rush helped to pull the switch on the lights 44 years ago and was present to assist in performing the same duty when the new fixtures were turned on. For others like Mayor Frank Bauer and Alderman James Bauer it was a repetition of history. When the old system was initiated more than four decades ago, their grandfather was chairman of Waterloo's municipal light committee and presided at that ceremony. Mayor Bauer's father was a member of the Waterloo P.U.C. for several years, serving a municipality which was one of the first to sign a contract with Ontario Hydro for its electrical supply.

AFTER





# ACCENT ON INFORMATION

Discussions and Visits to Ontario Hydro Departments

Set Pattern for Series of O.M.E.A. Meetings

AFTER a comprehensive review of the activities and functions of the Commission's Operations Division by its Director, C. B. Sharpe, the party visited the Power Supervisors' office where W. G. Chandler, Production Engineer (holding paper), explained the intricate mechanisms and how they are used in coordinating power generation and transmission throughout Ontario.

ANOTHER link between Ontario Hydro and the Ontario Municipal Electric Association has been forged by the recent inauguration of a series of "information meetings" for district representatives of the association.

Setting the pattern for future tours, the first of these fruitful discussions between the partners in the province's publicly-owned Hydro enterprise saw 16 members of District 6 O.M.E.A. taking an exhaustive tour of the Commission's Head Office in Toronto.

Escorted by Manager O. S. Russell and Ian Stubbs, Consumer Service Engineer, West Central Region, (whose boundaries include the municipalities associated with District 6 O.M.E.A.) the party also inspected the Commission's Research Laboratory on Strachan Avenue in Toronto and climaxed their tour with an enthusiastic inspection of Hydro's famed Niagara and St. Lawrence models.

Representing the public utilities commissions of Preston, Listowel,





Clinton, Elmira, St. Marys and Mitchell, the party was greeted on arrival in Toronto by O.M.E.A. President, A. A. Kennedy, Ontario Hydro Commissioner.

### Official Welcome

In extending an official welcome to these public-spirited citizens (many of whom experienced unpleasant driving conditions to reach Toronto), Mr. Kennedy praised the interest of his fellow-O.M.E.A. members in Ontario Hydro's widespread operations.

Emphasizing the importance of O.M.E.A. members becoming conversant with all aspects of Commission activities, the O.M.E.A. President pointed up the fact that Ontario Hydro, in effect, operates the Southern Ontario System in trust for the cost-contract municipal systems which it serves.

Urging each elected representative of a municipal Hydro system to become "a missionary for electric power," the speaker stressed that an intimate and thorough knowledge of Ontario Hydro operations would assist them materially in fulfilling their obligations and responsibilities as municipal commissioners.

"It is the duty and privilege of the O.M.E.A. and all its members

to maintain the strength of the organization, thus enabling it to cope with the expanding role of electricity in the development of our province and nation."

An important highlight of the tour was the meeting of the group with the members of the Commission, during which the visitors were welcomed by Dr. Richard L. Hearn, Chairman. Personal greetings were also extended by other representatives of the Commission, including: Hon. W. K. Warrender and W. Ross Strike, Vice-Chairmen; A. W. Manby, General Manager; Dr. Otto Holden, Chief Engineer, and E. B. Easson, Secretary. Lauding the inauguration of these information meetings, Dr. Hearn said they were an augury of even better relations between the Commission and the 338 cost and fixed contract municipalities it serves.

### Power Plans

Discussing the power situation, Dr. Hearn assured his Hydro colleagues that plans are now being laid for the power developments of a decade and more hence to ensure abundant electrical resources for the rapidly-growing urban and rural areas of Ontario.

With this assurance, the delegation proceeded to the "business of

the day," which was introduced by a discussion of the Commission's organization by James A. Blay, Director of Information. Mr. Blay's presentation was amplified by a full-scale review of the Commission's activities and reorganization to meet the rapidly-changing conditions experienced since the end of the Second World War.

### Consumer Service

Turning their attention to the specific problem of service, the visitors heard a brief discussion of the functions of Hydro's Consumer Service Division by its Director, I. K. Sitzer. In this connection, the speaker outlined the relationship between the work of the division in Head Office and its counterparts in the Commission's nine regional organizations.

Supplementing Mr. Sitzer's remarks, D. J. Gordon, Municipal Service Engineer, explained that the regional consumer service staff is the key contact between the municipal Hydro systems and Ontario Hydro and suggested that the utilities avail themselves, through their regional office, of the services available both at the region and at Head Office, on administration, financial, engineering and customer problems.

*(Continued on page 24)*

THIS group, including left to right: John McMichael, Listowel; C. C. Rachar, Elmira; Ian Stubbs, Consumer Service Engineer, West Central Region, and R. B. Hanna, Listowel, discuss the St. Lawrence model with Robert Johnson, left foreground.



ALEX Sparling, St. Marys (holding flask), demonstrates "pouring" skill to Technician Dorothy McLean. Indicating approval of his technique, left to right, are: W. M. Easton, Elmira; John McMichael, Listowel; W. E. Perdue, Clinton; C. C. Rachar, Elmira; Dr. H. A. Mutton, Mitchell, and Technician Norma Kimmerer. This photograph was taken during the tour of the Research Laboratory.







CONCLUDING the day-long meeting, T. E. Dietrich (standing), discussed this comprehensive display of published material and described the work of Ontario Hydro's Information Division.

A. W. Murdock, Rate Study Engineer, described the studies made by his department on rate structures and the regulations governing the application of rates.

E. W. McLeod, Chief Electrical Inspector, described the functions of his department and the work of Hydro's staff of 155 inspectors throughout Ontario.

### Operations Division

Another important aspect of the Hydro organization was dealt with by Clarence B. Sharpe, the Commission's Director of Operations. Dealing with the various sources of power, including hydro-electric, fuel-electric, purchased power, punctuated by an explanation of the effect upon system operation of the novel pumped-storage scheme at the Sir Adam Beck - Niagara Generating Station No. 2, Mr. Sharpe also conducted a tour of the Commission's main control room.

Here the visitors saw how Ontario Hydro's Power Supervisors co-ordinate the generation and transmission of power. Another point of interest

was the intricate network analyzer, in the new Engineering Building, where the Planning Division can duplicate in miniature the electrical system of a specified area.

Concluding their discussions on operations and engineering, the visitors focussed their attention on the financial side of Hydro.

During their discussions on this subject, Assistant Comptroller G. A. Honsberger gave an able description of the Commission's methods of accounting. Mr. Honsberger's remarks were illustrated by inspection tours of Hydro's Plant Accounting and Accounts Payable Departments where the visitors had the opportunity of seeing the latest in electronic accounting machines in operation.

### Visit Research Division

Following the morning session of concentrated discussion and luncheon, the party paid a visit to Hydro's Research Laboratory where G. B. Tebo, Director, and members of the Research Division staff co-operated in explaining the

methods used to co-ordinate their varied functions with the activities of other Divisions and departments.

The visitors also had the opportunity of learning the relationship between model studies and actual construction when they inspected the large models of the Niagara River area and the St. Lawrence Power Project at the A. W. Manby Service Centre at Islington.

Chiefly through the question-and-answer method, they gained an even clearer conception of the function of these replicas of two important power-producing rivers and how they have influenced the engineering designs evolved for the construction of Hydro's Sir Adam Beck-Niagara Generating Station No. 2, the Niagara Falls Remedial and Preservation program and the St. Lawrence Power Project.

### Information Division

Fittingly enough, the final discussion of the day-long meeting centred on the role of Hydro's Information Division. The multiple and necessary functions of this division were fully explained by T. E. Dietrich, Manager of the division's Services Department.

*(Continued on page 25)*



## HYDRO'S HALF-CENTURY

(Fort William Times-Journal)

The 50th Anniversary of the founding of Ontario Hydro will be observed in the year of 1956. The achievements of Hydro since it was initiated by the late Sir Adam Beck are so outstanding, extraordinary attention to the anniversary will be due from the provincial and municipal governments and by Ontario citizens generally, who, of course, are the owners of the giant industry.

Sir Adam lived long enough to see his project blossom and bear heavy fruit. In his most visionary moments, though, he could not have anticipated the full scope of Hydro's growth in three decades following his departure from the scene.

### ENTHUSIASTIC AUDIENCE

(Continued from page 9)

ford Township, as Second Vice-President. Directors elected were: Frank Kaupp, Merritton; H. J. Schneider, Port Dover; Cecil Swayze, Welland, and G. L. Foulds, Paris. As retiring President of the District, Mr. Barnes continues as a member of the executive.

#### Information Tours

Mr. Kennedy extended an invitation to representatives of the District, and to the O.M.E.A. generally, to participate in Information Tours of Ontario Hydro facilities currently being conducted in the Toronto area. The one-day tours, he said, begin at Head Office and conclude with a first-hand view of the Commission's facilities at Islington. The speaker said that these inspection visits are proving to be very popular and informative. If possible, the Commission plans to conduct one every two weeks, he added.

D. P. Cliff, of Dundas, O.M.E.A. Secretary-Treasurer, drew the attention of the meeting to plans being formed by a joint committee of the O.M.E.A.-A.M.E.U. and Ontario Hydro for the celebration of the Commission's 50th Anniversary. Celebrations, which will last throughout the year, will be arranged to coincide with significant dates in Hydro history. ■

### ACCENT ON INFORMATION

(Continued from page 24)

Assisted by a comprehensive display of literature produced by the Information Division, Mr. Dietrich discussed how this division directs its activities toward the ultimate objective of promoting general understanding of Commission operations. This, he said, is of prime importance, for as a publicly-owned enterprise, Hydro must keep its shareholders—the people of Ontario—fully informed.

#### Vote of Thanks

Speaking on behalf of the delegation (which also included G. R. Cook, Preston P.U.C.; Chairman A. D. Park, Mayor O. M. Nickel, Commissioner John McMichael and Manager R. B. Hanna, Listowel P.U.C.; Chairman W. E. Perdue and Commissioner George Rumball, Clinton P.U.C.; Chairman M. J. Oppenheimer, Commissioner W. M. Easton and Manager C. C. Rachar, Elmira P.U.C.; Commissioners Alex Sparling and Ross Marriott, St. Marys P.U.C. and Chairman R. L. Gatenby, Commissioner Dr. H. A. Mutton and Manager - Secretary Clarke F. Moses, Mitchell P.U.C.). Preston's Mayor W. C. Woods referred to the occasion as "unique" and extended the appreciation of the party for the volume of information received during the meeting. ■

### LOOKING AT LISTOWEL

(Continued from page 20)

Jacksonville, is as smart as any last-word metropolitan development, with the added advantage of being only a few minutes from the centre of the town. Ten churches . . . United, Presbyterian, Anglican, Baptist, United Brethren Missionary, Lutheran, Evangelical, Salvation Army, Pentecostal, and Roman Catholic . . . serve the spiritual needs of Listowel. The new Listowel District High School is one of the most up-to-date and attractive schools in the province, as is the modern public school. Of particular pride to Listowel is the Memorial Hospital on Bismark Street, which was founded in 1920 and now occupies its new building.

One of the longest-established newspapers in the province is the 90-year old *Listowel Banner*. Edited by George Tatham, 28, who is the third generation of his family in Listowel, the *Banner* has a weekly circulation of 2,400, covering a radius of 15 miles. It has, in the course of time, amalgamated with other newspapers, namely the *Astwood Bee*, the *Standard*, and the *Fordewick Record*.

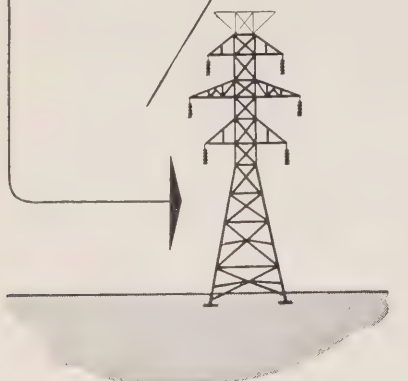
Life in Listowel is pleasant and productive. Its citizens are progressive and friendly.

That is accolade enough for any community. ■

#### Hydro Drivers Join Road Safety Campaign

Ontario Hydro employees in the Commission's Western Region (London) co-operated with the Ontario Government in its recent road safety campaign. R. M. Laurie, regional Manager, recently announced that some 550 drivers of Hydro vehicles in the region had been retested in an effort to further improve the Commission's safety record. The tests included a physical check, using psycho-physical equipment, and a 10-mile road test.

# ALONG HYDRO LINES



## Brantford P.U.C. Plans New Building

Brantford Public Utilities Commission has received approval to proceed with construction of a new administrative building. Approval has been given to expend \$769,533 from available funds and funds estimated to become available on the new building; on improvements to the utility's service building, as well as improvements to the electrical distribution system during 1955 and 1956.

On January 12, the Brantford Commission announced award of a contract for the new office building at a price of approximately \$394,000 to the Hamill Construction Company, Galt.

## Position Vacant

Applications are being received by Brantford Public Utilities Commission for the position of planning engineer. Qualifications should include some experience in distribution system and/or substation design. Replies which will be kept strictly confidential should be addressed to: The Manager, 32 Queen St., Brantford, Ontario.

## Marks 40th Hydro Anniversary

C. J. Halliday, Chairman of Chesley Public Utilities Commission, has a unique record of civic service. This year marks his 40th anniversary as a member of the local commission.

From 1906 to 1914 he was a town councillor, and from 1914 to 1918 he occupied the mayor's chair.

As early as 1914, when he was mayor, he was a pioneer in bringing Hydro to Chesley. In 1916, when Hydro had its inception in that town, Mr. Halliday was made chairman of the local commission, which office he has held ever since. He was President of the Engineering Association when it was merged with the Georgian Bay Municipal Electric Association and he has been closely connected with the Ontario Municipal Electric Association since its inauguration. He has served as President of the Georgian Bay M.E.A. for the past two years. At the present time he is an Honorary President and a District Vice-President of the parent body.

Born at Chesley in 1876, he at-



C. J. HALLIDAY

tended public and high schools there. In spite of his many and varied interests, he manages to find time to go boating, fishing and do some boat building.

Mr. Halliday recalls with pride, that his father, D. M. Halliday, was one of Chesley's pioneers, having been one of its first merchants.

## Would Regulate Antennae Erection

The Public Utilities Commission of Kingston has requested city council in a resolution to pass a bylaw providing that television antennae, either existing or future installations, conform to the standards specified by the Canadian Standards Association. The resolution, which also asked for continued and adequate inspection, followed an explosion at a local substation, which may have been caused by a television antenna falling across a 44 kv. subtransmission line resulting in a serious fault. In the discussions preceding unanimous approval of the resolution, the Kingston commissioners were informed that the guy wires, supporting the antenna in question, were practically rotted through.

## St. Thomas P.U.C. Appoints Assistant

William J. Underhill has been named Assistant General Manager and Engineer of St. Thomas Public Utilities Commission. In this capacity, he will be assistant to the utility's long-time General Manager, J. Walton Peart. A graduate in electrical engineering of Queen's University, Kingston, in 1949, Mr. Underhill joined the St. Thomas Commission in that year as Assistant Engineer and held that position until his latest appointment. A native of St. Thomas where he received his primary and secondary education, Mr. Underhill was awarded the D.F.C. while serving overseas with the R.C.A.F. during the Second World War. Married with three children, the 34-year old utility executive also received his B.A. degree from Queen's during 1955.



## J. R. PATTISON

Hydro lost one of its most ardent advocates and supporters on January 4, 1956, with the death of John R. Pattison, a veteran member of Fort William Hydro-Electric Commission.



J. R. PATTISON

in 1947 after 40 years' continuous service.

A native of Gateshead - on - Tyne, England, Mr. Pattison came to Canada in 1907. Employed with the Canadian Pacific Railway as a carpenter, the deceased retired

His interest in civic affairs has carried him into many municipal posts. In 1914 he was elected to Fort William Council, serving for five years. After a period of four years as a member of the city's board of education, he was elected to the Fort William Hydro-Electric Commission in 1930. Having served almost continuously since that time, Mr. Pattison took an active part in the affairs of both the Thunder Bay Municipal Electric Association and the parent O.M.E.A. At the time of his death he was a district director of the O.M.E.A. In recognition of his 20-year record of service with the Fort William Commission he received an O.M.E.A. long-service scroll at the 1955 convention.

A staunch trade unionist for 40 years, he served on the Ontario executive of the Trades and Labour Congress of Canada. In his earlier years, Mr. Pattison was an athlete of note, having played soccer with the Canadian Pacific Club when the team won the Dominion championship. He leaves to mourn his loss, his wife, two sons and two daughters. ■

More than two out of three families in Canada own their own homes.—*Quick Canadian Facts*

## HONOR RETIRING EMPLOYEES



NORMAN Maughan, 1955 Chairman of East York Hydro Commission (left), extends congratulations to William Hull and M. A. Gough, who were honored recently by the commissioners.

**M**EMBERS of the East York Hydro 25-Year Club and their wives gathered recently at Fantasy Farm in Toronto to honor Melvin A. Gough and William Hull, two retiring members of the staff of the East York Hydro-Electric Commission. Master of ceremonies for the occasion was Norman Maughan, Chairman of the East York Commission.

Mr. Gough who, in the words of Mr. Maughan, "kept the finances and accounting straight" during his 21-year tenure of office as Secretary-Treasurer of the commission, retired in his 76th year. At the time of his retirement he was believed to be the oldest active secretary of any public utility in Canada.

Born and raised in Napier, Ontario, Mr. Gough—or "Mel" as he is known to his many associates—attended school in Napier and St. Thomas and after holding various positions in Western Canada and Ontario came to East York Hydro in 1934 to do a special audit. The audit was so successful that the commissioners of that day requested him

to assume the position of secretary, which post he filled capably until his retirement.

Mr. Hull was born and raised in Bedford, England, where he learned the bricklaying trade and also worked for a telephone company before coming to Canada in 1910. He joined the Canadian army when war was declared in 1914, serving overseas with the 169th Battalion until the end of the war. He joined the staff of East York Hydro in 1942, where he worked as a groundsman and assistant storekeeper until his retirement.

Mr. Hull has three daughters and ten grandchildren, all residing in East York Township.

Speakers during the evening, in addition to Mr. Maughan, included the two other members of the commission, Reeve Harry Simpson and Commissioner Charles Ellerbeck, all of whom paid tribute to the guests of honor and thanked them for the contributions they had made to the development and growth of East York Hydro. ■



## ALTERATIONS COMPLETED

While work has been under way on the Niagara Remedial and Preservation Program, involving excavation and filling at both crests of the Horseshoe Falls, the smaller American cataract has been receiving a minor face-lifting. To make Luna Island safe for visitors, the flow over the Bridal Veil Falls (right), was diverted for some five months while crews blasted overhanging rock from the face of the tiny island. This familiar view from the Canadian side of the Niagara River shows flow over the Bridal Veil Falls resumed. The Luna Island area is to have a new stairway and railing to permit an unobstructed view of the American Falls.



## AWARDED A.I.E.E. FELLOWSHIP

Awarded in recognition of his outstanding part in the "development of interconnected pool operation of large electric systems on an international scale," a Fellowship in the American Institute of Electrical Engineers was formally presented to R. M. Laurie, Manager of Ontario Hydro's Western Region, at London recently. The 18th Canadian Fellowship in the institute was presented to Mr. Laurie, who has been associated with the Commission since 1920, during a meeting of the London subsection. Mr. Laurie is shown holding the parchment (centre), with L. S. Lauchland, Chairman of the London subsection (left), and J. P. Skillen, Chairman of the Hamilton section (right), who made the presentation.

*(Photo courtesy of London Free Press.)*



# FOTO-NEWS




## A LOOK AT THE FUTURE

Canadian scientists and engineers of the future had their first look at the nuclear power age recently during the showing of a film entitled "Britain's First Atomic Power Station — Calder Hall" in Toronto. Arranged by Ontario Hydro, a special presentation of the film was held at the Odeon Theatre, Toronto, for engineering and science students and graduates of the University of Toronto. Available for a limited time only, the film, depicting construction of the Calder Hall (England) Atomic Power Station as part of the United Kingdom's world pre-eminent program for the development of electricity from nuclear sources, was viewed by some 500 university representatives. Expressing his appreciation to Ontario Hydro Chairman Dr. Richard L. Hearn, who was instrumental in securing the film from the British Embassy in Washington, Dean R. R. McLaughlin, of the university's Faculty of Applied Science and Engineering, said the excellent attendance at the presentation was due to the fact that the showing was arranged to fit the academic schedule of most students as well as to the keen interest in this engrossing subject.

## A.M.E.U. HONORS RETIRED MANAGER

Colleagues and members of the A.M.E.U. Niagara Region honored A. S. Robertson, who retired recently as Manager of the Commission's Niagara Region. Meeting at Niagara Falls, Ontario, the group heard tributes to Mr. Robertson's noteworthy contribution to the A.M.E.U. during his 41 years' service with Ontario Hydro. On behalf of the regional members, of whom approximately 75 attended the meeting, Ray Pfaff, St. Catharines, who represents the Niagara Region as Director on the executive of the parent organization (right), presented Mr. Robertson with a handsome, folding travelling case.





HYDRO'S TALLEST TOWERS . . .



ONTARIO HYDRO

# News

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# ONTARIO HYDRO

# News

FEBRUARY, 1956

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## FORMIDABLE CHALLENGE

In the January issue, this column made reference to the Commission's decision to increase the capacity of two of its major plants — the Sir Adam Beck-Niagara Generating Station No. 2 and the Richard L. Hearn steam station in Toronto.

These additions, which are designed to assist in meeting peak demands in 1957 and 1958, provide gratifying evidence that Ontario Hydro is taking the necessary precautions to safeguard power supply to the province.

Through a continuing program of load studies, Hydro keeps a finger on the pulse of the province. The extent of these load studies and what they presage for Ontario, was revealed by Dr. Richard L. Hearn during a recent address. Speaking to members of the Hamilton section of the American Institute of Electrical Engineers, Dr. Hearn stated that the Commission's estimated total resources, within the next quarter-century may reach 23.6 million kilowatts. Reflecting the expanding importance of new sources of power supply, Dr. Hearn stated that it was expected that 5.5 million kw. would be from hydro-electric generating stations, 10.6 million from conventional fuel-electric and almost 7.5 million kw. from nuclear-electric stations.

Such an impressive augmentation of resources presents many formidable challenges, but judging from the editorial comments of such newspapers as the Cornwall *Standard-Freeholder*, Hydro enjoys the confidence of a large segment of Ontario citizens. In a recent issue, the *Standard-Freeholder* observed that "Sir Adam Beck and the handful of men who built Ontario Hydro as a publicly-owned utility would be amazed and proud if they could see their offspring today."

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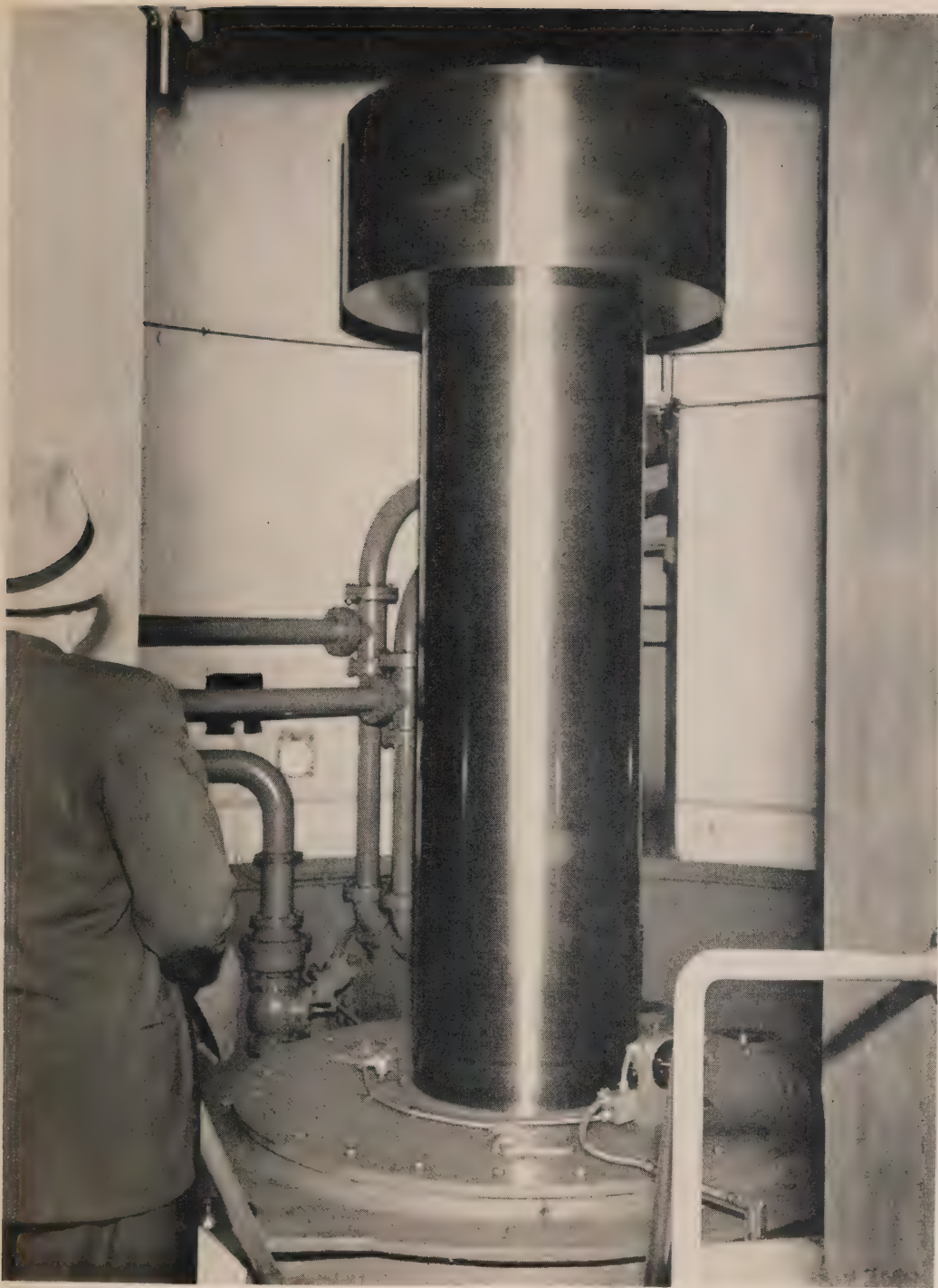
## COVER SHOTS

Excavation for the four principal structures associated with the St. Lawrence Power Project will include 4,220,000 cubic yards of earth and 505,000 cubic yards of rock. Little wonder then that Ontario Hydro contractors working on the Canadian side of the river require such heavy construction equipment as the "movalls" and the massive dragline bucket depicted on the front cover this month.

Travelling in northern Ontario near Marathon recently, a Hydro photographer recorded the striking winter scene on the back cover.



## POWER DERVISH



**T**HIS view in one of the turbine pits of the Sir Adam Beck-Niagara Generating Station No. 2 shows turbine shaft, turbine generator coupling flanges, and servomotor supply piping. The shaft is some ten feet high and 36 inches in diameter. A solid steel forging, the turbine shaft weighs approximately 85,000 lbs., or more than 42 tons, and spins at 150 revolutions a minute. Twelve generators are in operation at this station. Installation of four additional 75,000-kilowatt units in the main powerhouse will be started this year.



OVERALL view of construction at Hydro's pumping-generating station, which will be equipped with six reversible pump-turbines.

# REVERSIBLE UNITS



**N**IAGARA Falls, world-famous for its twin cataracts, seems destined to become noted also as the site of a 750-acre, man-made lake.

Unique in Ontario Hydro engineering and construction annals, the huge reservoir is designed as an integral part of the Commission's large power complex — the Sir Adam Beck - Niagara Generating Stations No. 1 and 2.

Situated on the lower Niagara River, near the historic Village of Queenston, these adjacent powerhouses (No. 1 completed in 1925, No. 2, initial phase, in 1955), draw their water from the upper Niagara by means of an intricate system of underground tunnels and open-cut canals.

The Niagara Diversion Treaty provides that, in order to reserve sufficient water in the Niagara River for scenic purposes, no diversions of water for power purposes shall be made, which would reduce the flow over Niagara Falls to less than 100,000 cubic feet a second during the daylight hours of the tourist season or less than 50,000 cfs. at any other time.

In order to make maximum use of the additional water available at night during the daylight peak demand periods, Hydro is now engaged in the construction of its pumped-storage scheme, in which the huge reservoir mentioned above is to have a significant role.

### Unusual Powerhouse

Also involved is the building of Hydro's most unusual powerhouse to accommodate six huge pump-turbines. These pumps will draw off water from the power canal at night, the water being stored in the 650,-000,000-cubic foot reservoir. During the daylight hours, when peak demands occur, the water will do a "turnabout." At these times, it will flow back through the powerhouse, the pump-turbines acting as turbine-generators in reverse. The conversion from pump to turbine operation will be made simply by moving a switch.

Located adjacent to the forebays of the Sir Adam Beck generating plants, the pumping-generating station and the dykes for the reservoir have been under construction for several months.

Despite the fact that major construction activity associated with the initial 12 units of the new Sir Adam Beck plant, concluded several months ago, some 1,300 or more men have been engaged on the pumped-storage project.

### Dyke Construction

A major job, of course, is the building of the dyke for the reservoir, which covers an area roughly two miles long and approximately one-half mile wide.

Varying in height from 15 to 65 feet, the huge circular wall has a circumference of some four miles. Consisting of a massive rock fill, supporting an impervious clay blanket, up to 45 feet thick in some places, the dyke has sloping sides with the base ranging in width from 265 to 280 feet.

Special attention is being given to the construction of this dyke, which must be able to withstand internal pressures engendered by the rapid 25-foot drop in the water level in the reservoir when water is being used for power generation during daylight hours. Disc harrows have been used to aerate or break up the clay lumps. Clay compaction is effected by the use of "sheeps-feet" rollers equipped with studs.

This large lake — larger or equal in size to many in the numerous tourist districts of Ontario — would be of little practical value without the pumping-generating station, however.

The first of its kind ever built by Hydro, the novel plant is located at the head of a small canal leading from the main power canals of the Niagara development.

### Pump-Turbine Installation

Satisfactory progress can be noted at this point, where installation of the pump-turbines is now underway.

*(Continued on page 4)*

## Hydro's unique pumped - storage scheme to augment output of its Niagara development

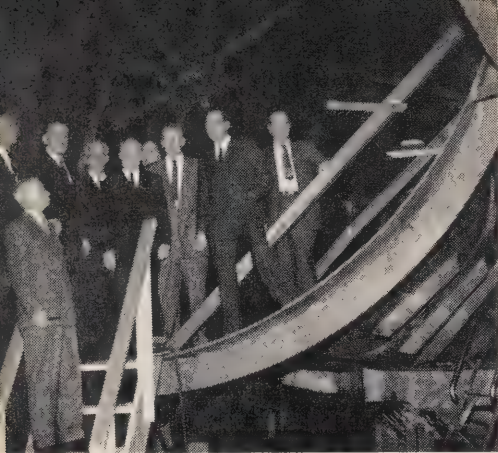


THIS new powerhouse is located at the opposite end of a short canal leading off the main power canals (see foreground), which also convey water to the Sir Adam Beck-Niagara Generating Stations Nos. 1 and 2.



A SECTION of the dyke for the reservoir. The dyke, with a circumference of approximately four miles, consists of a massive rock fill (shown in this photograph), which will support an impervious clay blanket.





△

INSPECTING a scroll case inlet for one of the six pump-turbines being supplied by the English Electric Company of Canada Ltd. are Hydro Chairman Dr. Richard L. Hearn (standing on steps), and left to right: H. B. Style, English Electric President, A. W. Manby, Hydro's General Manager, James MacVicar, Dr. O. Holden, Commission Chief Engineer, G. J. Warnock, M. Temple, M. J. Sowry, W. Bolam.

One of the many firms tendering for the supply of this equipment was the English Electric Company of Canada, which submitted two tenders. One was for conventional pumps and turbines, the other for a radically new type of equipment, especially designed for this project by the company's Hydraulic Department — combined pump-turbines. This design made possible a very great saving in cost over the use of conventional pumps and turbines. After careful study to ensure that these designs were practical, the Commission awarded a contract to English Electric Company to supply this equipment.

The six pump-turbines, which are

of very large size, are being manufactured for English Electric by its associated company, John Inglis Co. Limited. Both Inglis' Toronto plants are involved in the project. The original fabrication of the equipment takes place at the Strachan Avenue works, near the C.N.E. grounds. Machining is done at the Scarborough plant, making use of the company's 43-foot boring mill, regarded as the largest in Canada.

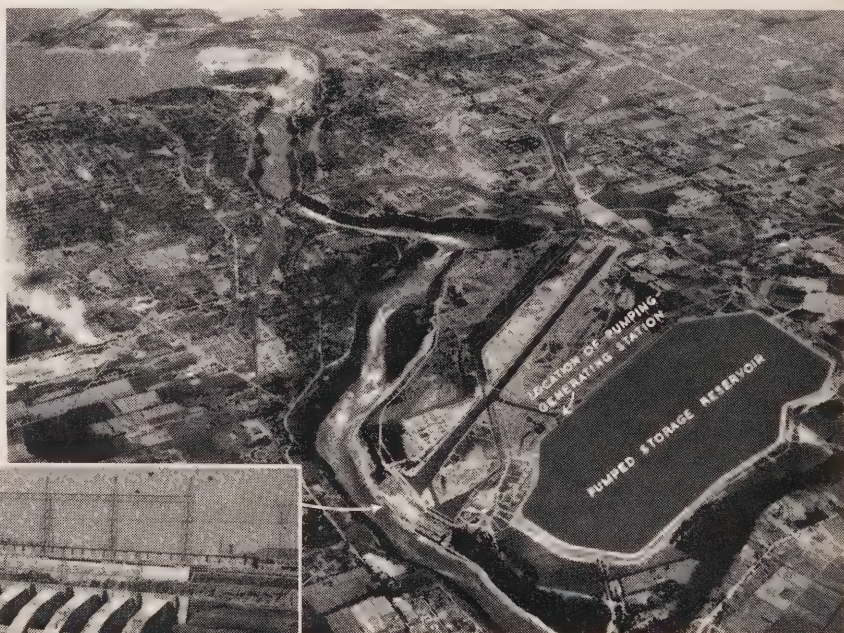
A contract for more than \$3½ million has been awarded to Canadian Westinghouse Company, Hamilton, for the manufacture of the six associated motor-generator units.

### Modified Outdoor Units

These units will be of the modified outdoor type, being protected by removable housings. Thus, the powerhouse for this project will be the first station built without the

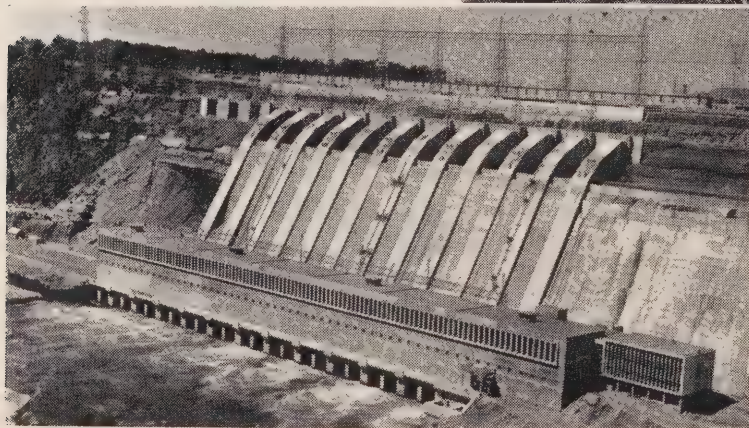
conventional type of superstructure over the generating room. A similar design will be followed in the construction of the Robert H. Saunders-St. Lawrence Generating Station.

Scheduled for completion during 1957, this important and revolutionary hydro-electric project at Niagara, which will have an installed capacity of 170,000 - kilowatts when completed, is noteworthy also in the fact that it enabled the Commission to make provision for four additional units at the Sir Adam Beck - Niagara Generating Station No. 2. With 12 units already in service, this mammoth plant, in company with the allied pumped-storage scheme will have a total ultimate installed capacity of 1,370,000 kilowatts, constituting one of the largest developments in the world. Installation of the four additional units will be started this year.—By The Editor.



△

MARKED photograph above illustrates the scope and location of the pumped-storage reservoir and generating station. The arrow indicates the location of the Sir Adam Beck-Niagara Generating Station No. 2 (left photograph). Provision was made in the design of this plant for four additional units (see apertures, upper left, left photo). Installation of these units will commence immediately.



△





PARLARE Italiano! Speaking in Italian, Alex DeMaio, Manager of Hydro's A. W. Manby Service Centre, describes the frequency standardization program and changeover procedures.

# "C-DAY"

## REVISED VERSION

ONTARIO Hydro representatives, particularly those associated with the Information Division, have given many addresses on frequency standardization in English. For the first time, however, a lecture has been given in the Italian language, while the script or dialogue for that now-familiar Hydro film "C-Day" was switched to the Italian tongue.

Regarded as one of the largest ethnic groups in Toronto, the Italian community includes many new Canadians who have not, as yet, attained fluency in English.

Many of these newly-arrived citizens are to be affected by the frequency standardization program now progressing in the Queen City, necessitating Hydro's first venture into this form of bilingualism to avoid misunderstanding when the changeover crews arrive.

### Club Cooperates

After discussions with Fathers Eugene Cottone, Edmund Ansaloni, O.F.M., and Ricardo Polticchia, priests at St. Mary of the Angels and St. Agnes Roman Catholic Churches, which number many new Canadians on their lists of parishioners, arrangements were com-



THIS group, including left to right: Augusto Taus and Jerry Malisani, President and Manager respectively of the Italo-Canadian Club; Douglas Cook, Hydro Field Publicity Officer, and Fathers Eugene Cottone and Edmund Ansaloni discuss final arrangements for the meeting.

pleted by Hydro Field Publicity Officer D. H. Cook with Jerry Malisani and Augusto Taus, Manager and President respectively of the Italo-Canadian Recreation Club, for the use of the club hall.

Some members of the Commission staff are fluent Italian linguists and two of them, Alex DeMaio, Manager of the A. W. Manby Service Centre, and Miss Melba Faggiani, a secretary in the Frequency Standardization Division, volunteered their services.

### Revise Film

The "C-Day" film sound track was eliminated and the script translated into Italian and recorded on tape by Mr. DeMaio and run off with the film. Four recordings had to be made, however, before the Italian dialogue and the film synchronized satisfactorily.

Prior to the showing of the

"C-Day" film, Mr. DeMaio, speaking in Italian, outlined the reasons why the changeover program had been undertaken, and how his audience would be affected by it. He also told them how they could obtain information or service on any matter connected with changeover and recommended that they should ask a friend to telephone Hydro's frequency standardization office on their behalf if they felt their English was not adequate.

At the conclusion of the film, Ontario Hydro and Mr. DeMaio were thanked, in Italian of course, by a member of the audience for sponsoring the program.

It was felt that this original venture of adapting a Commission information service to the special needs of some of its customers had been completely successful.

*By Frank C. Wood*



# PATHWAYS

Chapter V — Part 1

## HYDRAULIC TESTS AT THE SITE

By J. J. Traill\*

**H**YDRO-ELECTRIC power plants are designed to secure the maximum of electrical energy from the water power available. If the machinery installed at the powerhouse fails to meet the requirements of efficiency and economy of operation, the usefulness of the whole development will be adversely affected. As the hydraulic set-ups vary with different developments, especial care must be taken to provide the proper equipment for the particular job. And after the erection of the generating units, extensive performance tests must be carried out to determine whether or not they are functioning according to specifications.

The primary hydraulic test — made to determine the efficiency and capacity of the turbine — is commonly known as the acceptance test. This involves accurate measurements of the head of water acting on the turbine, the quantity of water flowing and the power produced by the turbine. Of these measurements, that of the quantity of water flowing, owing to the conditions under which it has to be taken, is, in many respects, the most difficult to make.

Some idea of the difficulty experienced in measuring this factor

will be gained from a consideration of the very large amount of water which may pass through a turbine every second. For example, at the Sir Adam Beck-Niagara Generating Station No. 2 this is as much as 3,800 cubic feet a second. This water is moving at high velocity through a complicated succession of conduits and passages. Moreover, when a plant is in operation — as it often is when acceptance tests are made — the water flow cannot be measured in canal, forebay, or tailrace, as the flow to or from other units beside the one being tested is moving in these channels.

Various methods of measuring quantity of water flow have, however, been devised, some adaptable to one layout and others to another. Several of these methods will be briefly described.

### The Gibson Method

The first is known as the Gibson method and was devised by Dr. Norman Gibson, formerly Vice-President and at one time Chief Engineer of the Niagara Mohawk Power Corp. and hydraulic engineer

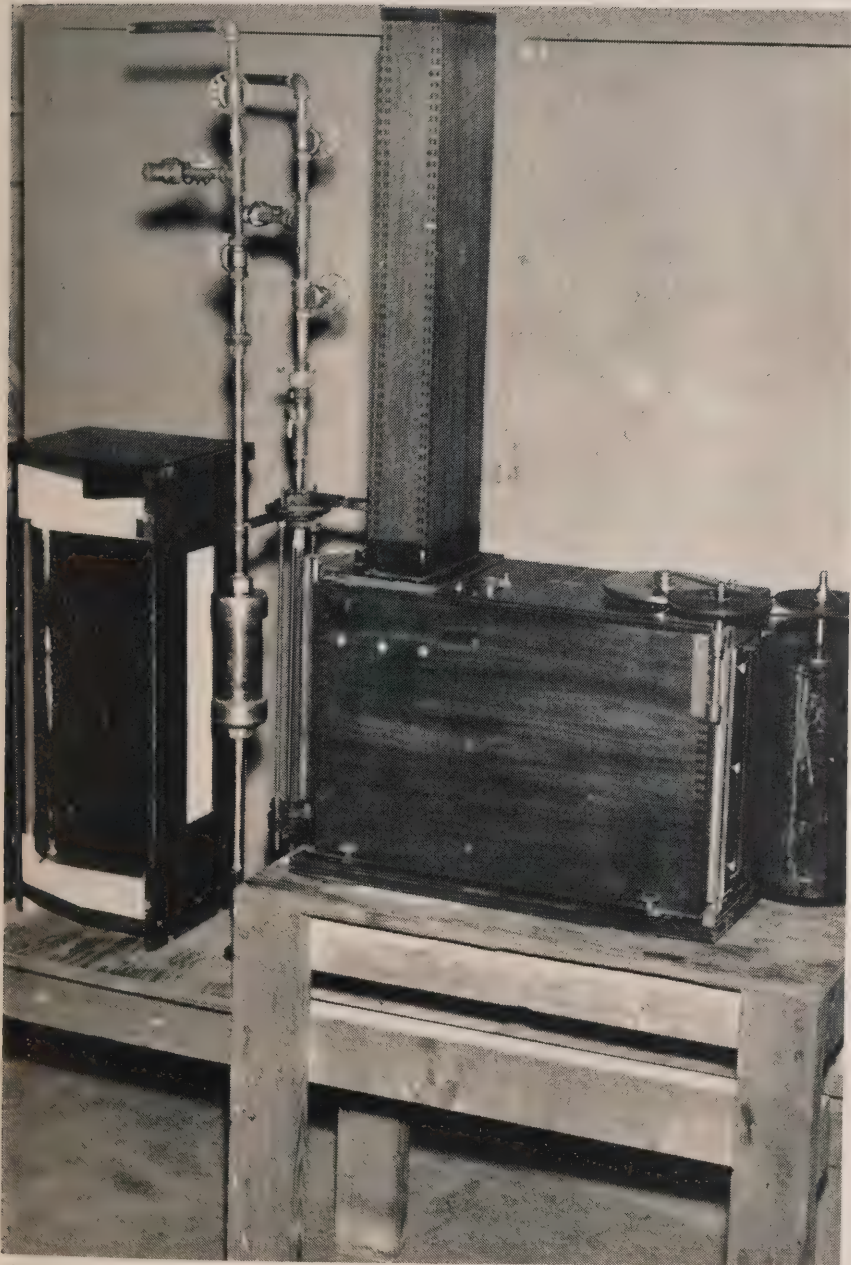
of the Ontario Power Company. It is based on the principle that the change of momentum of a body (in this case a body of water) is proportional to the impulse causing the change.

Suppose one attaches an instrument for measuring pressure to the penstock supplying water to the turbine and then gradually closes the gates of the turbine, the mass of water in the penstock will be brought to rest and, if its velocity originally was say 10 feet a second, the change in its momentum will be this quantity "10" multiplied by its mass. While the gates are closing, the change in pressure and the time during which it acts can be measured. The pressure measures the force acting on the water and this force, multiplied by the time during which it acts, is the impulse changing the momentum of the water. By measuring the diameter and length of the penstock, the mass of the water in it can be calculated and the impulse having been measured by the pressure measuring instrument, then the only unknown quantity in the equation: "the impulse is equal to the change in momentum" is the change in the velocity of the water. As the final velocity of the water

\* (Mr. Traill was Ontario Hydro's Hydraulic Engineer and latterly Consultant on hydraulic problems prior to his recent retirement.)



# TO POWER



△  
THIS Gibson instrument is used by Hydro engineers on numerous occasions to measure the quantity of water supplied to hydraulic turbines in carrying out acceptance tests to ascertain that the turbines are functioning according to guarantees of efficiency and capacity.

is zero, the change is equal to the velocity before the turbine gates began to close. This velocity multiplied by the cross-sectional area of the penstock is the amount of water flowing to and through the turbine, and is usually expressed as so many cubic feet a second.

### Measures Impulse

The instrument used to measure the impulse is known as a Gibson instrument and is shown in one of the illustrations. It consists of a mercury U-tube, in which the level of the mercury measures the pressure and the change in pressure in the penstock. A short section of the U-tube consists of clear glass tubing of uniform bore set up in front of a special camera in which a photographic film on a circular drum moves at a uniform rate past a narrow slot and provides a photographic record of the movement of the mercury column in the glass tube, during the closure of the turbine gates and for a few seconds before and after, as well. In the tall column near the front of the instrument, a pendulum swings past the camera lens once each second, marking time intervals on the film. Calibration of the U-tube, timing of the pendulum, interpretation and scaling of the record on the film all involve careful and accurate measurement, but in principle this method of measuring the quantity of water supplied to the turbine is simple, precise and scientifically sound. It has been applied in all of the power plants at Niagara Falls, and also at Chats

*(Continued on page 8)*



Falls, at Abitibi Canyon and at many other power plants in the province.

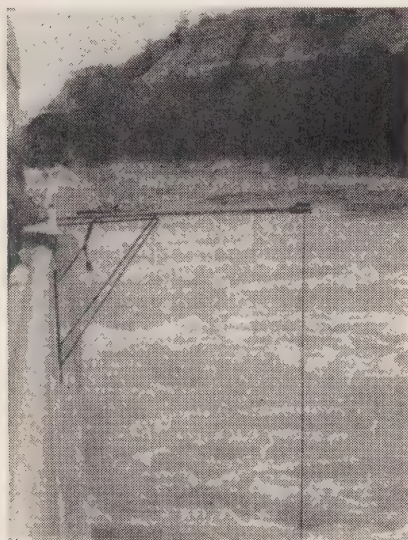
### Measurement By Current Meters

In many low head plants with open flume settings, the Gibson method is not applicable and recourse is made to the current meter for measurements of the flow.

In using the meter to measure the flow through a turbine, the measuring section is usually selected at the headworks, and the meter (or a group of meters) is rigidly attached to a movable frame or rod and placed successively at 30 or more points on the measuring cross-section. At each of these points the velocity is measured, and the velocity multiplied by the partial area to which it applies gives the part of



CURRENT meter measurements are frequently taken from boats. Here two hydraulic technicians are measuring water velocity along the Mattagami River in northern Ontario. Rating tables of water flow in a particular river are prepared from these metering investigations.



TEMPORARY chain gauge set up for measurement of tailwater elevation during a Gibson test at Sir Adam Beck-Niagara G.S. No. 2.

the total flow passing through the small area. By summing these several flows the total flow to the turbine is obtained. This method interferes less with the ordinary operation of the power plant than the Gibson method, but requires a much longer time for the completion of a test.

Sometimes it is possible to install a sharp-crested weir in the tailrace of the power plant and measure the

flow thereby. The weir raises the tailwater level during the test and is applicable generally for the measurement of moderate flows only. This method was used at Eugenia Falls and South Falls where flows are relatively small.

### Salt Velocity Method

A method, which is greatly favored by some organizations but which has not been used by the Commission's staff, is that known as the "salt velocity" method. This method is based on the fact that salt in solution increases the electrical conductivity of water. A charge of salt in solution is injected into the conduit and its movement across electrodes, suitably disposed at points downstream, is recorded graphically on electrical instruments. The time of passage from the point of injection to the electrodes is measured accurately. The flow in cubic feet a second is equal to the volume of the conduit between point of injection and electrodes divided by the time of passage of the charge. This method involves considerable expense for the installation of the equipment, experience in its design and operation

and very accurate measurement of the time interval.

A simpler method, sometimes very useful for approximate tests, is the color injection method. In this, a charge of a solution of a strong coloring matter, such as fluorescein, is injected into the conduit and its time of passage to the draft tube outlet is observed. This method, used successfully by the Commission's staff in a number of instances, requires only a small amount of equipment and enables tests to be carried out with a minimum of disturbance to the regular operating procedure at the plant. It is, however, less reliable than the other methods described.

### Measurement Of Heads

In coming to a discussion of the measurement of heads, it should be pointed out that in a plant or unit test, the head is the difference in level of headwater and tailwater, while in a test of the turbine alone it is the above head less all friction losses to the entrance to the turbine casing. In the former case, the measurement is relatively simple, but



for its accurate determination it is customary to install a float well — possibly a 12-inch pipe with a small opening communicating with headwater or tailwater — so that waves and surges of the sometimes turbulent water surfaces are damped. A float installed in the float chamber, a rod supported by the float, and a scale, make a very simple instrument, enabling precise measurements to be made during the test.

It is common practice now to install also permanent headwater and tailwater gauges, which automatically transmit an indication of the water level to the control room of the powerhouse. One of them is actuated by an instrument in the forebay and the other by an instrument in the reservoir at the main dam about three-quarters of a mile away. Both measure headwater level, but at different points. The difference in their indications measures the loss of head in the power canal. These water-level indicators are essential for safe and satisfactory operation of the plant, but, for tests, the simple float gauge is more reliable and accurate.

In the test of the turbine to determine its efficiency, the head is measured at entrance to the turbine casing. Here the pressure head might be measured by an ordinary pressure gauge, but this is not usually sufficiently accurate and it is, therefore, common practice to use a mercury U-tube even for measurement of high pressures.

### Measurement Of Power

The measurement of the power developed by the turbine has been referred to in connection with the measurement of the efficiency of the generator. The power developed by the turbine is simply the power transmitted by the turbine to the generator. This is determined by measuring the output of the generator and adding the generator losses. For the turbine efficiency test, these losses are computed from electrical measurements made during each run of the test, accurate calibrated instruments being used for this purpose.

Measurement of the three quantities — flow, head and power — provides the information to enable the efficiency of the turbine and the complete unit to be calculated.

### Test Of Whole Unit

The acceptance test is made at the same time as, and as part of the test of the whole unit. The procedure followed, when the quantity of water flow is measured by the Gibson method, is to synchronize the unit with the system in which it operates.

The turbine gates are opened to the point at which it is desired to make the particular test run. Then, on signal, they are closed at a predetermined rate. Before, during and after their closing, observers stationed at all instruments set up for the tests, make the necessary observations. The individual test run requires about five minutes and is followed by a series of similar runs covering the full range of the gate opening and load.

The acceptance tests of the tur-

bine are carried out primarily to determine whether the capacity and efficiency guaranteed by the manufacturer are realized. In the course of the tests, a great deal of additional information is gathered. The friction loss in intake and penstock is measured to check the designer's computations and to be used as a guide in future developments; the flow required to generate various outputs is determined so that the operating staff may keep records of flow from day to day; the leakage through turbine gates is measured and observations are made of certain pressures related to flow. Once accurately measured and related to the power output of the unit or certain differential pressures, the flow may be determined at any future time by much simpler means than those which have been described. It is customary now to install flow meters on each unit, rated by the hydraulic tests, to provide a continuous record of water used by the turbine.

Turbine guarantees are made for  
(Continued on page 19)



TESTS conducted at Hydro's Abitibi Canyon plant on one of the units provided valuable advance information relating to the performance of this unit when it was dismantled and moved to the DeCew Falls Generating Station (above), where it operates on a higher head.

# MARSHES MAKE



LOOKING along the drainage canal at the Bradley farm toward the pumphouse where water is raised by an electric pump into an artificial marsh.



RAISED from the drainage canal by the 10-horsepower pump, the water flows down this spillway into the large marsh.





## NOVEL, "WET LAND" FARM AT PAINCOURT FINDS ELECTRICITY ONE OF ITS MOST USEFUL ALLIES

By Horace Brown



**T**O THE average person, a muskrat is something that makes a nice fur coat.

But to Bruce F. Bradley of Paincourt, Ontario, and his sons, the raising of muskrats, fish and wild ducks has become an interesting and rewarding occupation.

Dry and wet land farming is carried on in areas lying below the level of surrounding bodies of water. Such a condition exists in a wide area of southwestern Ontario adjacent to Lake St. Clair. Here, man has combined with nature to make possible both types of farming.

With the assistance of the Ontario Government and municipal councils, huge relief ditches have been dug to carry off and regulate the flow of water in the low-lying land. Massive dykes have been built to hold back the lake and the rivers, while the roads have been built along the top of many of the dykes.

Without electricity and natural gas, these projects would be much more difficult. Large pumping stations, operated by electric motors or gas engine motors operating on natural gas, keep the water table of this land at the level deemed necessary for the particular crops to be grown in the dry land farming sections. Similarly, in wet land farming, pumps keep the water at the proper level for growing the muskrats' favorite aquatic foods . . . such as bullrushes, cattails, marsh potatoes, sedges, water-lilies and a wide variety of pond weed. Producing desirable water levels provides good nesting-places and stopover sanctuaries for thousands of wild ducks in the spring and fall. Many fish are caught in these man-made

marshes. The revenue from hook-and-line fishing to the Bradleys from fishing in the marsh and in the adjoining Thames River, has averaged \$2,300 each year for the last 3 years.

### 2,000-Acre Farm

Mr. Bradley and his sons, together with Bradley's brother and sister in the United States, own 2,000 acres, of which 600 acres are used for dry land farming and the rest for wet land purposes.

The 1,400-acre wet land farming scheme has been the vogue at the Bradley farm for the past 25 years.

For their present wet farming, they use land that they had kept dry from 1912-1929 for raising standard dry land crops of their district, namely corn, oats, barley, sugar beets, onions and hay. But in the spring and summer of 1929, when Lake St. Clair was at the crest of a high cycle, all of the Bradley land was flooded three times from the lake, and they were able to pump dry and crop only one-fifth of their land. By the spring of 1930, the Bradleys decided to go along with Nature and allow four-fifths of their land to stay wet. But, as Lake St. Clair water levels were dropping in 1930, they bought a second-hand pump to keep this four-fifth of their land wet, pumping water from the lake on to their wet farm or artificial marsh to maintain desirable water levels in their marsh.

What seemed a disaster in 1929, when their land was first flooded, has become a successful enterprise that affords a wide variety of interests to the family and also to bird-watchers and wildlife students, and much recreation for fishermen



ANOTHER important electrical application is this five-horsepower motor, which operates a fan for drying corn and onions. Bob Bradley (left), makes a minor adjustment, with Dorothy Nauta and her friend "supervising."



and picnic parties. Besides the muskrats, ducks and fish, a flock of wild swans visit the marsh both in spring and fall in their north and south migrations, adding to the color and beauty of the place.

Over the years, the dry-and-wet land farm scheme has cost Mr. Bradley a great deal of money, because he says he was lacking in practical experience when he started. But making money is no longer his prime objective, although it naturally has its place. He has a theory, which he has put into practice, that the important thing in life is "creating values," i.e., land values, human values and spiritual values, although he has always been challenged by raw, undeveloped land that could be made useful.

In the dry land section of the farm, the Bradleys keep the water level or water table at the proper depth for the optimum growth of corn, onions and beets, registered seed wheat and oats and improved

grasses. There are 45 acres of onions, about 370 acres of corn, some 50 acres of red beets, 25 acres of wheat and 25 acres of oats. The balance is in improved grass fields. In addition, about 300 head of cattle are fed each winter.

#### Crop Rotation

Wise farmers, the Bradleys get maximum production by crop rotation. Land is left in hay and pasture for two-year periods. Naturally, the cattle benefit from this procedure as well as the soil, so nothing is wasted.

This appreciation of the latest methods of farming is also demonstrated by the many applications of electricity found at the Bradley farm.

A 5-horsepower motor is used to operate a fan for onion-drying. The onions are stacked in a bin, 8 feet deep by 36 feet wide and 60 feet long. Air is blown under the false floor of the bin and the electrically-

driven air travels up through the onions, proving particularly effective in this bulk-drying scheme.

At present, the Bradleys also dry some 15,000 bushels of corn a year by the natural air method. The air is blown through cribs by a 42-inch fan, operated by another 5-horsepower motor. Eventually they hope to have a building suitably equipped for drying corn with heated air.

Electrically-operated conveyors are in frequent use on the farm for moving and grading vegetables.

Estimating that their electrical bills range between \$800 and \$1,000 a year, the Bradleys say there is no question that this is economical for the varied tasks Hydro performs.

#### Traded Mine

Naturally, a project such as this has a man at its head who has a real love of the land and of nature. Bruce Bradley was born in Toledo, Ohio. Back in 1912, when Bruce was





COVERING an area of some 1,400 acres, the Bradley marsh, which abounds with many varieties of fish, including bass and other types, attracts visitors from numerous distant points.

a young fellow of 22, his father, with a partner, owned an idle coal mine in West Virginia and traded it for 1,655 acres of idle land in south-western Ontario, which was growing marsh hay and practically nothing else. The father intended to have young Bruce develop the latter property and sell it. However, by the time Bruce had put the farm in shape for sale, he couldn't find a buyer for the farmland and he had become greatly attached to the property. More than 40 years later, that attachment is still there, perhaps in increased measure.

Three married sons now help their father operate the farm . . . Bob, 36, who has two sons and a daughter; David, 31, with one son, and John 29, with three sons. There is a regular staff of seven and, during the year, the farm gives employment to 40 or 50 persons, mainly school children and some neighboring men and women who want to make extra money as casual help.



LOCATED on Bradley property, this attractive public school was built and maintained by Bruce Bradley for many years. Today it serves several families living in the immediate area.

The Bradley farm is practically a community in itself. There are 11 well-equipped houses on the farm. In the early days Bruce Bradley even built a school, because the roads were too muddy for children to

travel regularly, and paid for heating and janitor's work. Today, the school on the Bradley property is maintained for the 12 to 15 pupils in the same way as any other rural school in Ontario. ■



# MODEL DEMONSTRATIONS

## St. Lawrence Seaway, Power Officials Witness Ontario Hydro Hydraulic Tests

AT THE first meeting of its type yet held by all interested St. Lawrence agencies, both seaway and power, the St. Lawrence River Joint Board of Engineers (Canadian section) arranged for an unique series of demonstrations at the Ontario Hydro models building at Islington, near Toronto, on January 26.

The purpose of the demonstration was to show that the procedures proposed by the power agencies for the construction of the project now under way on the St. Lawrence River will not adversely affect Lake Ontario levels. The responsible power agencies, represented at the demonstration, were the Power Authority of the State of New York and Ontario Hydro.

As a large group of distinguished international officials looked on, the Ontario Hydro model engineers carried out a series of tests showing the sequence of operation for river control during the construction period. The demonstration marked the culmination of a long period of study, design and verification by all interested agencies and confirmed the feasibility and soundness of the methods being followed.

Represented at the demonstration were the International Joint Commission, the International St. Lawrence River Board of Control, the Saint Lawrence Seaway Development Corporation and The St. Lawrence Seaway Authority. The technical staffs of both sections of the St. Lawrence River Joint Board of Engineers were also present.

The Canadian section of the Joint Board of Engineers is headed by the Hon. George C. Marler, Minister of

Transport (who is the Board Chairman), and the Hon. Lionel Chevrier, President of the St. Lawrence Seaway Authority, with M. V. Sauer and H. W. Lea acting as alternates. Messrs. Sauer and Lea are consulting engineers of wide experience in the design of hydraulic developments and their construction in Canada. The United States section of the Joint Board of Engineers is headed by Hon. Wilber M. Brucker and Hon. Jerome K. Kuykendall, with Major Gen. Charles G. Holle and Francis L. Adams as alternates. G. H. Kohl is the Chief

Engineer of the Canadian section and R. H. Hayes is the Chief Engineer of the United States counterpart.

Officials of the Canadian section of the Joint Board of Engineers paid tribute to Ontario Hydro for its "far-sightedness" in designing and constructing its St. Lawrence hydraulic scale models long before formal approval had been given for the joint seaway and power undertaking. Engineers with the Board emphasized that the Hydro models are the only facilities of their kind available for detailed study of the



DISCUSSING various aspects of water-level control during Ontario Hydro's St. Lawrence model tests were, left to right: Gen. A. G. L. McNaughton, Chairman, Canadian Section, International Joint Commission; Hon. Lionel Chevrier, President, St. Lawrence Seaway Authority and a member of the Canadian Section, St. Lawrence River Joint Board of Engineers; Dr. Otto Holden, Chief Engineer, Ontario Hydro; H. W. Lea, Canadian Section, Joint Board of Engineers and Hon. Len Jordan, Chairman of the U.S. Section, International Joint Commission.





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KEITH Henry, Generation Department, Ontario Hydro (holding microphone), describes the sequence of operation for river control as the international officials watch adjustments being made in the functioning of Hydro's miniature replica of the important Long Sault dam.

St. Lawrence River and its characteristics. All interested agencies, it was pointed out, appreciate Hydro's readiness to make its models available for engineering study of the power and navigation phases of the St. Lawrence Project.

A brief description of the functions of the various interested boards and agencies taking part in the demonstration is set forth herewith:

#### **International Joint Commission**

An international regulatory body charged with the responsibility of protecting the interests of Canada and the United States in respect to boundary water problems and other matters associated with international undertakings of this character.

#### **International St. Lawrence River Board Of Control**

A Board of Control created by the International Joint Commission,

responsible for the regulation of Lake Ontario under operating conditions. The Board of Control is kept informed by the Joint Board of Engineers on matters relating to lake levels and outflows during the construction period.

#### **St. Lawrence River Joint Board of Engineers**

An international body representative of the Canadian and American governments and charged with the responsibility of seeing that the works are constructed in accordance with the order of approval given by the International Joint Commission in 1953.

#### **Saint Lawrence Seaway Development Corporation**

The Corporation is responsible for the design and construction of the United States phase of the St. Lawrence Seaway Project and, ulti-

mately, for the administrative responsibilities associated with the Seaway.

#### **The St. Lawrence Seaway Authority**

The Canadian agency responsible for design and construction of the Canadian phase of the navigation undertaking in the St. Lawrence River. On completion of the seaway project, the Authority will act as the permanent administrative body with responsibility for tolls, shipping and related functions.

#### **Power Agencies**

The staffs of the Power Authority of the State of New York and Ontario Hydro are co-operating closely in regard to the required St. Lawrence power structures. The Power Authority is under the chairmanship of Robert Moses, while Ontario Hydro, under the chairmanship of Dr. Richard L. Hearn, is undertaking its part of the project under the direction of Dr. Otto Holden, the Commission's Chief Engineer. ■

Annual figures indicate a 12 per cent increase in primary energy production in 1955, Hydro Chairman tells delegates



# HYDRO HIGHLIGHTS

**D**ELEGATES attending the recent annual general meeting of District 4 O.M.E.A. compressed a lot of business into their one-day session at Toronto's King Edward Hotel.

During an interesting and informative meeting, they heard a comprehensive review of Ontario Hydro operations in 1955 by Chairman Dr. Richard L. Hearn.

A striking highlight of Dr. Hearn's address was his report that the Commission generated and purchased 23,257,600,000 kilowatthours for primary load purposes in 1955, representing an increase of about 12 per cent over the corresponding figure for 1954. The speaker added that energy requirements of municipal electrical utilities increased by some 10 per cent during the same period, while rural power district energy demands were up by slightly more than 11 per cent over 1954 and primary energy supplied to direct industrial customers increased by more than 17 per cent.

"This is just one year's experience," Dr. Hearn said, "but it demonstrates why Ontario Hydro, in an effort to keep pace with the mounting demands for power, has spent more than one billion dollars during the last 10 years to expand its facilities."

As a result, 14 of the 18 new power sources presently authorized have been brought into operation in various sections of the province. Ontario Hydro's dependable peak capacity at the end of 1955 reached more than 4.5 million kilowatts, an increase since 1945 of 134 per cent, in order to meet demands which have grown from less than two million kilowatts at the end of the war to more than 4.2 million kilowatts in December, 1955.

Despite the fact that two major fuel-electric stations have been constructed at Toronto and Windsor and most of the readily accessible sources of hydro-electric power including the Ottawa, Niagara and St. Lawrence Rivers have been tapped, the Commission anticipates it will be faced with a lower margin of reserve than is considered safe on a predominantly hydro-electric system before 1960.

"It is now apparent that additional capacity will be required to provide a reasonable reserve in 1957 and 1958 to take care of such emergencies as low water conditions, breakdown of equipment or abnormal load growth."

## Additional Units

In providing this additional capacity, Ontario Hydro is proceeding with the immediate installation of

two additional 75,000-kilowatt units at the Sir Adam Beck-Niagara Generating Station No. 2 and one 200,000-kilowatt unit at the Richard L. Hearn fuel-electric station in Toronto, the speaker told his audience. (In a later address, Dr. Hearn also announced approval of the installation of the 15th and 16th units at the Sir Adam Beck No. 2 station. These units are additional to the two units mentioned in the foregoing paragraph. — Editor's Note).

On the subject of future fuel-electric generation, Dr. Hearn stated one of the logical locations for the next major steam station will be Hamilton, where the Commission owns suitable property.

"This development" he went on "will be subject to improvements being made to the city's local deep waterway which, we expect, will provide us with an additional 35 acres of land. If this is undertaken, a station with a capacity of up to one million kilowatts could be constructed when necessary."

## Fuel-Electric Sources

Referring to studies, which had been made concerning future power requirements, the speaker said these indicated that, within a comparatively short period of time, the Commission would change from a predominantly hydro-electric utility





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PANEL members, left to right: Bertram Merson, Dr. V. S. Wilson, W. Ross Strike, A. W. Murdock, C. O. Bick and H. J. MacTavish were caught in a jovial mood as they prepared for a discussion of new rate structures.

to one which derives most of its power from fuel-electric sources.

"Within the next 25 years" he stated, "it is estimated that our total resources may be 23.6 million kilowatts. Of this amount, 5.5 million kilowatts will be from hydro-electric generating stations, 10.6 million from conventional fuel-electric, and almost 7.5 million kilowatts from nuclear-electric generating sources."

Concluding Dr. Hearn said: "You have your own problems in getting the power to the customers after we have generated it. Don't keep your sights too low gentlemen, keep them up."

During the general business session, Secretary D. G. Moffitt reported that 94 per cent of eligible municipalities are members of District 4, while the Executive Committee announced that no action is being taken at the moment on the question of customers' deposits in view of the fact that the parent organization has this matter under consideration.

President A. A. Kennedy outlined details of a tour available to members comprising a visit to Ontario Hydro's Head Office, the Research Division and the A. W. Manby Service Centre, and urged members to take advantage of it. Dealing with plans to mark the jubilee of Ontario Hydro, he announced that a 30-minute film is available, as well as literature to accompany the film, while material could be pro-



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DELEGATES took particular interest in the address of Hydro Chairman Dr. Richard L. Hearn, who reviewed construction progress and system operations in 1955 during annual meeting.

THESE officers, seated, left to right: W. E. Wright, Toronto Township; Bertram Merson, Toronto, President; Dr. V. S. Wilson, Etobicoke Township; A. H. Waites, Mimico; standing, left to right: C. J. Ellerbeck, East York Township; J. T. Armstrong, Georgetown; D. G. Moffitt, Toronto, and J. A. Orr, North York Township, will direct District 4 activities during 1956.

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vided as background for talks which utility officials may wish to give to service clubs in their own municipalities.

Dr. V. S. Wilson, reporting as chairman of the committee appointed to investigate the question of standard wage scales for employees of member commissions, said that difficulties, such as agreement on fringe benefits in various utilities,

working conditions, hours of work, job classification, paid holidays, pension and insurance, etc., had been experienced in attempting to induce municipalities to agree to any standard wage scales. Several municipalities expressed the opinion that the principle of standard wages was not practicable, suggesting that many men preferred to work on a weekly

(Continued on page 18)

wage basis and be paid during sickness. It was also pointed out that if there were standard wages it would be necessary to conduct examinations before men could qualify as first-class linemen. Dr. Wilson's committee, therefore, recommended that no further action be taken.

Despite this recommendation, a resolution was moved and seconded that the question of standard wages and standard electrical rates be referred to Ontario Hydro for study.

Some delegates were of the opinion that one wage scale and one rate should be studied because of its possible use should complete amalgamation of municipalities in the Toronto Metropolitan area be effected.

It was pointed out that standard wages would concern not only linemen, but all sections of utility staffs, which would entail uniformity of job specifications within the area. One delegate said a vote for such a scheme would be tantamount to requesting Ontario Hydro to set utility wages and rates.

After further discussion, President W. E. Wright called for a vote and the resolution was defeated.

### Pension Report

Bertram Merson, reporting on pensions, said that of the 32 municipalities in the district organization, 17 operated under the Municipal Hydro-Electric Pension and Insurance Plan. Some have other pension arrangements while 10 of the municipalities have no pension plans at all. He expressed the conviction that trained men prefer to work for municipalities where they can qualify for pensions and offered to provide assistance to any municipality, which contemplated organizing a pension plan for its staff.

Pressing on with a tightly-packed agenda, a panel consisting of W. Ross Strike, A. W. Murdock, Dr. V. S. Wilson, H. J. MacTavish, C. O. Bick and Bertram Merson then discussed 'Hydro Rates.'

Mr. Strike as panel chairman,

pointed out that in the early days it was necessary to find uses for power, but now the task is to provide power for the demand which already exists. He said the Rates Committee of the A.M.E.U. has studied all the rates used on this continent, so their findings cover a wide area. The new formula provides for a four-block domestic rate structure, but it is proposed that the new structure come into operation only as municipalities raise or lower their rates. Windsor and Niagara Falls are changing their rates, Windsor using the four-block and Niagara Falls a three-block structure.

Mr. MacTavish said the change in the rate structure is due to changes in conditions during the last 30 or 40 years. The principal change is the increase in load factor of various municipalities; in consequence the load factor of Ontario Hydro has increased. The peak demand period occurred in the early evening for many years. Today it may fall at any time between 8 a.m. and 6 p.m.

Mr. Murdock pointed out that the new structure would result in increases in cost to only a small percentage of domestic customers. He added that, at 750 kilowatt-hours, the customer cost per kwhr. reaches the lowest possible value, consistent with the cost situation in the municipality. While the fourth rate is higher, it is not a penalty rate. It simply holds the cost per kwhr. at the same value for all additional consumption.

Dr. Wilson said the new rates are more complicated and asked why there could not be a simple energy rate. He suggested that Ontario Hydro provide complete information to each utility on rate structure changes.

Mr. Bick raised the question of the amount of work involved for a commission changing from a two-block to a four-block structure and asked concerning the possibility that it would entail an increase in the cost of billing.

Called upon by the chairman,

J. E. Teckoe, Jr., of Windsor, replying from the floor, said experience in Windsor has shown there is no extra cost involved in billing domestic customers and that some commercial customers are billed at the domestic rate.

Winding up the discussion, Mr. Strike said the Commission would act on Dr. Wilson's suggestion respecting information to the municipalities, pointing out that the whole idea of the rate structure is to ensure that all customers are fairly treated.

The Nominating Committee reported that officers for 1956 are: Bertram Merson, Toronto, President; W. E. Wright, Toronto Township, Past President; Dr. V. S. Wilson, Etobicoke Township, 1st Vice-president; A. H. Waite, Mimico, 2nd Vice-President; Directors — C. J. Ellerbeck, East York Township, J. T. Armstrong, Georgetown, and J. A. Orr, North York Township, and D. G. Moffitt, Toronto, Secretary-Treasurer.

Messrs. M. A. Gough, East York Township, and Ronald Harrison, Scarborough Township, who retired as auditors, were presented with electric clocks in recognition of their services.

Harry Hyde, Assistant Chief Engineer of the Toronto Hydro-Electric System, in an informative after-dinner address discussed voltage problems confronting utilities. In this connection he pointed out that the outstanding factor in the last five years has been the unprecedented load growth, and reminded his hearers of Dr. Hearn's prediction, made that afternoon, that there would be a five-fold load growth in the next 25 years. He suggested that it would be found necessary in the next few years to use a higher voltage, in the City of Toronto at least.

Concluding the meeting, the penalties and hazards of inadequate wiring were illustrated by the showing of the Electric Service League's film "The Magic Link."

—By Frank C. Wood.



## PATHWAYS TO POWER

*(Continued from page 9)*

operation of the unit at a particular head. Actually, the head may be different from this for much of the time. If the unit can be run at speeds different from the normal operating speed, it is possible to derive from the measurements the results that would be obtained at various heads. Such a test was possible in one of the units at the Abitibi Canyon plant, the unit being run at various speeds ranging from 10 per cent below to 10 per cent above normal. The information was particularly valuable when the generating unit was transferred to the DeCew Falls development where the gross head is 265 feet, as compared with 240 feet at Abitibi Canyon.

### Tests Of Governing Equipment

Tests of the governing equipment are made to check its behavior in normal and emergent operations. The measurements include the percentage increase in speed above normal and the pressure rise in the penstock when the governor closes the turbine gates. Rapid governor timing results in excessive pressure rise and slow timing in excessive speed rise. The tests enable the timing to be adjusted to secure the most satisfactory governing condition in normal operation while keeping the pressure rise and speed rise within safe limits during an emergency shutdown.

Related to the speed rise in the penstock is the surge in the power canal when the turbine gates close suddenly. In single unit or two-unit plants having power canals leading to the forebay, this is a hazard which must be provided for in design of forebay walls. Tests are made to measure the surge with sudden shutdown to check the computed values. Measurements are also made of friction loss and friction coefficients in the canal under conditions of steady flow.

Construction of the power plant nearly always raises the water level in the river channels upstream.

Frequently after the plant is in full operation, prolonged tests at various flows are necessary with measurement of water level at strategic points to enable the operator to maintain the desired headwater levels at points more or less distant from the plant.

### Analysis Of Measurements

A case in point is that of a plant which is supplied from a lake-like expanse of river through a canalized channel leading to the forebay, while flood waters pass through a natural outlet leaving the canalized channel between the lake and the forebay. The forebay level at the plant is, of course, lower than the regulated lake level, and the lake, being distant from the plant, is not under direct observation. This difference in gradient varies with the use of water at the plant and flow through the sluices in the flood-water channel. From an analysis of measurements at several flows, a series of graphs was developed to enable the operator to regulate flood discharge and forebay levels to maintain the lake level within predetermined limiting elevations. Similar conditions obtain at many other plants necessitating investigations of channel flows and levels to secure the maximum operating head at the plant without undue wastage of water.

Investigation of the capacity of control and floodwater sluices in the dam may be required to enable complete flow records for the river to be secured. Tests of ancillary structures, such as log-chutes, are also necessary to measure their flow capacity while sluicing sawlogs and pulpwood satisfactorily.

The staff, who are to operate the station, arrive a short time before the station is scheduled to go into operation to give them an opportunity to become familiar with the physical layout of hydraulic and electric plant and the operation of equipment. There is usually a period from the time when the unit is first turned over until after it is dried out and tested, when it is still in the hands of the manufacturer.

After it is once synchronized and commences to deliver commercial load, its operation is the responsibility of the operating staff, although, for a period — usually of 30 days — the manufacturer is required to have an engineer available in case trouble should develop.

### Staff Must Be Diligent

The manufacturer of equipment usually guarantees it for a period of one year against defects in material or workmanship. During the first months of operation, the operating staff must be diligent in detection of such defects in their early stages, so that the condition can be remedied before the trouble has extended to the point where a major repair job is necessary. Such difficulties usually show up in shorter time than a year, after which operation becomes a matter of routine, with the maintenance of equipment in first-class condition as the essential job, and the occasional system "shakeup" due to line trouble or equipment failure as a variation from normal operating duties. ■

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### Tilbury Plans System Expansion

Tilbury Public Utilities Commission will spend approximately \$40,000 this year on improvements to its electrical system as part of a three-year, \$68,000 expansion program. Plans call for a new 60-cycle substation to coincide with frequency standardization operations in that community which start next month. One of the major jobs for changeover crews will be the installation of a new 60-cycle pump at the local pumping station with a 1,200-gallon a minute capacity.

### Stratford Plans Discussions On New Building

Stratford Public Utility Commission will study the advisability of constructing a new office building or renovating the existing one this year.

# ST. LAWRENCE

Thousands of visitors see construction work

from two convenient vantage points

THE day of the "sidewalk superintendent" has ended as far as residents and visitors to the Cornwall area of the St. Lawrence River are concerned. Those who are fascinated by work — or by watching other people do it — are now "river superintendents," busily supervising, from two comfortable vantage points provided by Ontario Hydro on the Canadian side of the river, the work now in progress on the St. Lawrence Power Project.

A third lookout, built by the St. Lawrence Seaway Authority, 35 miles up the St. Lawrence River at Iroquois Point, provides a view of the seaway canal and lock and also of the Iroquois control dam. The main function of this dam will be to permit regulation of the outflow of water from Lake Ontario.

The first lookout site was opened recently at Maple Grove, about three miles west of Cornwall. It is a 50 x 12-foot platform, 20 feet above the ground, complete with railing. From it the public can obtain an excellent view of the main cofferdam and the unwatered north channel of the river, in which excavation for the foundations of the two powerhouses on either side of the international boundary is now under way.

The Maple Grove lookout, which can accommodate approximately 100 people at a time, is constructed of Bailey bridge sections. Already an estimated 40,000 people have

climbed the stairway to reach this platform and watch the progress of construction work.

Another, but less elaborate lookout, has been provided to give a view of the Long Sault Rapids. These rapids, incidentally, won't be there by the spring of 1957 as the St. Lawrence River will have been rerouted by that time to permit completion of construction of the Long Sault control dam by the Power Authority of the State of New York. The Long Sault lookout requires no elevated platform, such as at Maple Grove, since it is on high ground overlooking the river and, thus, offers a natural vantage point. In addition to viewing the rapids, the visitor can get a first-hand look at the control dam construction near the area where the rapids will be halted.

## Billboard Illustrations

At the two main lookouts, large, attractive maps and drawings of billboard size, portray work to be done in the respective areas. The powerhouse site billboard consists of an artist's colored drawing, which gives the visitor an excellent conception of the completed development. This drawing shows the powerhouses which, in themselves, will act as a gravity dam spanning the north channel of the river from the Canadian shore to Barnhart Island. Flanking the power dam are the dykes which will impound the water and form a huge lake stretching back upstream.

This drawing also shows the finished Long Sault dam, as well as the international seaway and locks through which shipping will pass into the flooded area. Also indicated are the many new islands that will ultimately dot the future lake — or power project headpond — to be created as a result of flooding.

The Long Sault lookout is provided with an enlarged map of the area affected by the development, showing the main structures associated with the project, as well as the extent of flooding. A smaller map indicates the location and function of the Long Sault control dam.

## Dual Function

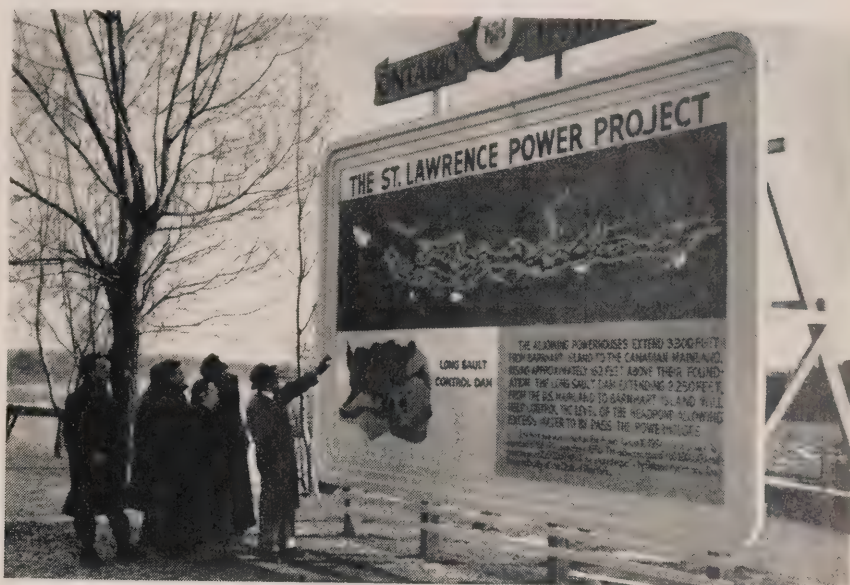
Hydro's St. Lawrence lookouts serve a dual function. Providing convenient vantage points for viewing work in progress at close range, they also minimize the necessity for sightseers entering the actual work areas. Their presence in large or unsupervised numbers in these areas would create traffic hazards and hamper the movement of vehicles and equipment to the numerous construction sites.

They offer the additional advantage of eliminating the necessity of craning necks or running the danger of clashing fenders for motorists driving along Highway No. 2. Complete with parking areas, they permit onlookers to relax in comfort and safety while inspecting one of the world's great construction projects. —By Gordon Murphy



# LOOKOUTS

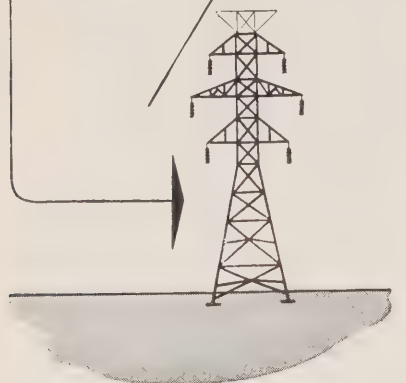
PERCHED on a high point of land, overlooking the turbulent Long Sault Rapids, this large map has been erected by Ontario Hydro to pinpoint the various phases of construction associated with the development. ▷



PROVIDING an excellent view of Ontario Hydro's powerhouse work area is this Bailey Bridge platform, which can accommodate approximately 100 persons at a time. The map below gives visitors a clear conception of the St. Lawrence Seaway and Power Project. ▽



## ALONG HYDRO LINES



### Waterloo Alters Billing System

Indicating Waterloo's continued growth, the public utilities commission has authorized a new system of billing and collection of Hydro accounts. Under the new system, which came into effect in January, billing will be done by wards every two months with a different discount date for each ward. The first discount date in 1956 for power and commercial accounts was January 16 and the same day in every following month. Domestic customers in the municipality's north ward were able to obtain a discount up until January 25 and on the same day of every second month for subsequent accounts: First discount date for the east ward was February 10 and on every second month thereafter. Other dates have been set for the west and south wards. Introduction of the new system is designed to relieve pressure on the billing staff and to allow more efficient handling of accounts. Previously, the 16th of the month was the last discount date for every billing period for all customers.

## HYDRO CHAIRMAN RECEIVES ENGINEERS' HIGHEST HONOR

ONTARIO Hydro Chairman Dr. Richard L. Hearn recently received the highest honor accorded an engineer by the 14,000-member Association of Professional Engineers of Ontario.

The coveted Professional Engineers' Medal, struck in 1946, and awarded to only four persons since that time, was presented to Dr. Hearn on January 28 during the association's annual luncheon meeting in Toronto. More than 1,000 members of the association from all parts of Ontario, as well as representatives from other provinces and the U.S., attended the meeting.

The Engineers' Medal was awarded to Dr. Hearn, not only for his contribution to Canadian engineering as a hydraulics authority, but for his more recent prominence in the realm of nuclear energy. He has been instrumental in making available considerable information on atomic energy for peaceful uses to Canadian industry and also in

encouraging industrial enterprises to develop their own reactors.



DR. R. L. Hearn

The actual wording of the illuminated citation, which accompanied the award read: "The Professional Engineers Medal presented by the Association of Professional Engineers of the Province of Ontario for outstanding achievement by one of its members is awarded to Richard Lancaster Hearn, B.A. Sc., D.Eng., P.Eng., Chairman of The Hydro-Electric Power Commission of Ontario, for his distinguished accomplishments in the sphere of hydro-electric engineering and for his contribution to the welfare of mankind in furthering the application of nuclear fission in peacetime uses."

The four previous recipients of the medal are: Rt. Hon. C. D. Howe, Dr. C. R. Young, Gen. A. G. L. McNaughton and Dr. J. B. Tyrrell.

### Picton Long-Service Commissioner Retires

H. B. Tully, who served as a member of Picton Public Utilities Commission for 27 years, was honored by fellow-commissioners with the presentation of a suitably engraved silver tray. Mr. Tully's service, which was continuous, except for one year, witnessed a record expansion of the town's electrical and water systems in which he played a leading role.

### Industrial Commission Gets \$1,000 Grant

St. Thomas P.U.C. has approved a \$1,000 grant to the local industrial commission for promotion work, \$600 of which will be met by the Hydro department and the remainder by the water utility.

### St. Catharines P.U.C. Names Committees

R. D. Hunter has been named Chairman of St. Catharines P.U.C. for 1956. F. R. Cavers heads this year's Works Committee, with Commissioner George Laughlin in charge of the Finance Committee. The local commission recently announced approval of an extended medical and hospitalization plan for employees.

### Goderich Long-Service Employee Honored

William Proctor, an employee of Goderich Public Utilities Commission for the past 21 years, was honored by members of the local commission at a recent presentation ceremony.



### **Long Service Brockville Employee Retires**

Recalling the days when he traversed Brockville streets with a burning taper to light the community's gas-illuminated street lights, Byron C. Serviss retired recently from the Brockville P.U.C. staff.

Born at Iroquois, Mr. Serviss joined the local utility staff on May 1, 1905 (more than a year before Ontario Hydro came into being), one of his first jobs being lamp-lighter. He performed this useful function until electricity replaced the gas system. Since that time he has been a linesman and meter reader, and latterly timekeeper and storekeeper, serving under five managers. Marking his retirement after 51 years' service, Brockville's oldest employee was the recipient of a presentation made by Chairman Henry Walter on behalf of the commission and staff.

### **Former Regional Accountant Dies At Belleville**

Former Accountant with the Commission's East Central Region, Robert L. Brown died at Belleville recently.

Born at Deseronto, he spent practically his entire life in the Belleville area. He retired from the regional staff in 1954. A veteran of World War I, Mr. Brown was an ardent sportsman and active in fraternal and service club work. He is survived by his wife, two brothers and one sister.

### **Ingersoll Staff Draws Praise**

Members of the local Kiwanis Club recently approved a resolution commending Manager Douglas Seath and line staff of Ingersoll Public Utilities Commission for the decoration of local streets during the recent Christmas season. Two large bells, decorated in evergreen and illuminated with colored lights were hung at the two main intersections to create a very attractive effect.



## **INSPECTOR GETS HYDRO TEST**

Inspector Finlay Carroll, of London City Police, seated at right, is being tested by Ontario Hydro Safety Officer H. E. Morgan, left, for one phase of his driving ability. Looking on during a safety demonstration for Hydro's Western Region, are: London Township Police Chief Gordon Stronach, second from left; R. M. Laurie, Hydro's Western Region Manager; Inspector George V. Clubbe, head of O.P.P. No. 2 District. Inspector Carroll is undergoing a field of vision test which measures in degrees how far a driver can see to either side while looking straight ahead.

### **In Public Life For 37 Years**

S. J. Babe, one of Oshawa's most public-spirited citizens, has started his 37th year in civic office. The only surviving member of the city's board of education for 1918 when he served as Chairman, Mr. Babe was elected to City Council in 1932. He was also a member of the Oshawa Welfare Board from 1932 to 1937 and Chairman of the Old Age Pension and Mothers' Allowance Committee in 1948-1949. This year he is starting his 24th consecutive year on the Oshawa P.U.C., of which he has been Chairman for 14 different terms.

### **Sandwich East Voters Approve New System**

Voters of Sandwich East Township (Windsor district) at the recent municipal elections authorized the township council to complete a municipal cost contract with Ontario Hydro for the purchase of power from the Commission.

The voters also authorized the township to borrow a maximum of \$1,250,000 to purchase the distribution facilities in the municipality presently owned and operated by Ontario Hydro through its Windsor Operating Area. Both questions on the ballot received substantial assent.

### **Windsor Commission Completes Building**

Windsor Utilities Commission has completed a modern, three-storey office building at Ouellette Avenue and Elliott St. to accommodate its Hydro and water divisions. Formerly the Hydro division was housed in the utility's building on Chatham St. while the water division was located on the sixth floor of the Canada Building. The new building was opened for business recently. Completed at a cost of \$750,000 furnished, the new structure represents several years of planning and the accumulation of financial reserves to cover the cost of construction.

Commencing its service to Windsor citizens completely debt-free, the building has been designed with business offices for both divisions on the main or street floor. In addition to the main business office, a display and sales room for electrical appliances is also located on the main floor for the convenience of local customers. Executive officers and the board room are situated on the second floor while the engineering staffs will be accommodated on the third floor.

### **Stamford P.U.C. Approves Pole-Moving Charge**

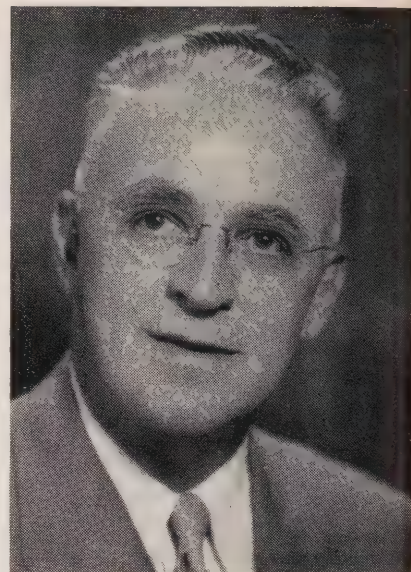
Stamford Public Utilities Commission has adopted a suggestion that a fee of \$70 be charged for the moving of poles carrying electrical distribution lines. Local commissioners were informed by Manager Harold Brownhill that the utility is receiving numerous requests from contractors and private individuals to move existing poles after completion of new homes. It has been found, in several instances, that many new householders choose pole sites for the location of driveways. With many new housing subdivisions being completed in the area served by the local commission, the cost of moving poles, previously performed as a free service, has been reaching serious proportions.

## **HARRY J. FOY NAMED LEAGUE MANAGER**

**A**PPPOINTMENT of Harry J. Foy as Manager of the Electric Service League of Ontario was announced recently by President W. N. Herod.

Mr. Foy comes to the League after more than 15 years' service in the Sales Dept. of Ferranti Electric Limited. During this period he served in varying capacities, latterly as Manager of Sales Promotion. Previously he had been with Line and Cable Accessories Limited for five years and Ontario Hydro's Electrical Engineering Dept., Station Design Section, for a period of 13 years.

The League's new manager is known to the electrical utility industry across Canada, particularly in Ontario, where he has had many years of intimate contact with the membership of the Ontario Municipal Electric Association and the Association of Municipal Electrical Utilities. He is a member of the Association of Professional Engi-



HARRY J. FOY

neers of the Province of Ontario, an associate of the American Institute of Electrical Engineers and the Canadian Institute of Mining and Metallurgy.

### **Ottawa Hydro Sells Eastern Region Offices**

Ottawa Hydro-Electric Commission has announced the sale of the Hydro-Electric Building to the Guarantee Trust Company of Canada at a price of \$255,000. Presently occupied by Ontario Hydro, as the headquarters of the Commission's Eastern Region, the building will become vacant later this year when the headquarters are moved to a new building now under construction.

### **Record Peak At London**

A. L. Furanna, Chief Engineer, London Public Utilities Commission, reports that city customers used a record amount of electricity in 1955. Representing an all-time high, the peak demand on December 28 reached 57,050 kilowatts.

### **Veteran Township Commissioner Retires**

One of two original members of Brantford Township Hydro-Electric Commission, George F. Unger has retired after 26 years' continuous service as a Commissioner.

Although 81, Mr. Unger had no intention of retiring, but when that portion of the township in which he resides was recently annexed by the City of Brantford, Mr. Unger became ineligible to sit on the township commission.

Mr. Unger, with Roy Pierson, has been a member of this utility since its formation in 1930. Only twice in his civic career did he find it necessary to participate in election contests, both of which he won. Born in the United States, he came to Canada when he was nine years old. For 14 years he was Brantford Township road superintendent.





## HONOR RETIRED ENGINEER

**"R**oss Dobbin Day" at Peterborough Rotary Club was highlighted by the presentation to Mr. Dobbin of an oil portrait by Archibald Barnes. The presentation (photograph on the right), was made by W. Ross Strike, Vice-Chairman of Ontario Hydro (left), to Mr. Dobbin (second from left), former Manager of Peterborough Utilities Commission, while Club President Ken Dalrymple and Rex Martindale, former Manager of Sudbury Hydro-Electric Commission, look on. Mr. Martindale, like Mr. Dobbin, was honored by Ontario Hydro with the naming of the R. H. Martindale Transformer Station at Sudbury.

In the lower photograph, the illuminated address signifying the naming of the Ross L. Dobbin Transformer Station and presented to him by Mr. Strike a few years ago is examined, left to right, by Mr. Strike, Peterborough R.O.A. Manager Robert Aspinall, E. G. Gurnett, Manager of the East Central Region, Ontario Hydro, and Mr. Dobbin.







**SHADOW AND SUBSTANCE**

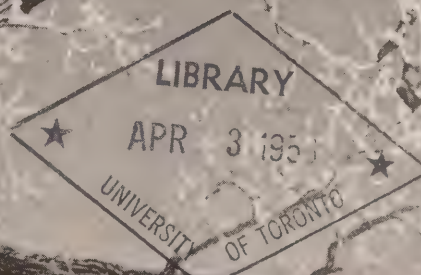




ONTARIO HYDRO

*News*

MARCH, 1956



ST. LAWRENCE WINTER . . .



# ONTARIO HYDRO

# News

MARCH, 1956

VOLUME 43, NUMBER 3

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## PRE-EMINENT POSITION

EARNING such plaudits as an "admirably clear and vigorous submission," the Ontario Government's brief to the Royal Commission on Canada's Economic Prospects contained many refreshing illustrations of the pre-eminent place Ontario occupies in the roster of Canadian provinces. Approximately one-third of the nation's population and 27 percent of its labor force reside in Ontario, for example, with approximately 60 percent of this force engaged in manufacturing. In this connection, the 184-page document, presented by Prime Minister Leslie M. Frost, emphasized the heavy concentration of industry in Ontario, which, for more than 50 years, has accounted for half the value of the country's total manufacturing output.

Premier Frost also made reference to the dynamic influence of electrical power on practically every phase of Ontario's economy. This was made abundantly evident in the section of the submission dealing with agriculture, which pointed out that "the extension of rural electric power service has been a major factor, not only in reducing farm costs, but also in bringing the amenities of the urban centres to the country."

Substantiating the Ontario Government's prediction that "rapid development for Ontario in all fields of economy is definitely foreseen," the brief presented by Hydro Chairman Dr. Richard L. Hearn, on behalf of the province's publicly-owned electrical system, contained the encouraging observation that Hydro's total resources, according to present estimates, may be 23.6 million kilowatts within the next 25 years.

Emphasizing the contention of the provincial brief pertaining to the standard of living enjoyed by Ontario residents (which "may be estimated to have gone up 35 percent since 1942 and nearly 53 percent since 1939"), Dr. Hearn cited the impact of television receivers on power demands within the province. Between 1949 and the end of 1955, almost one million sets were delivered in Ontario. When taken collectively, this one piece of equipment alone represents a possible load equivalent to the combined peak loads of the Cities of Guelph, Kitchener, London, Windsor and Port Arthur.

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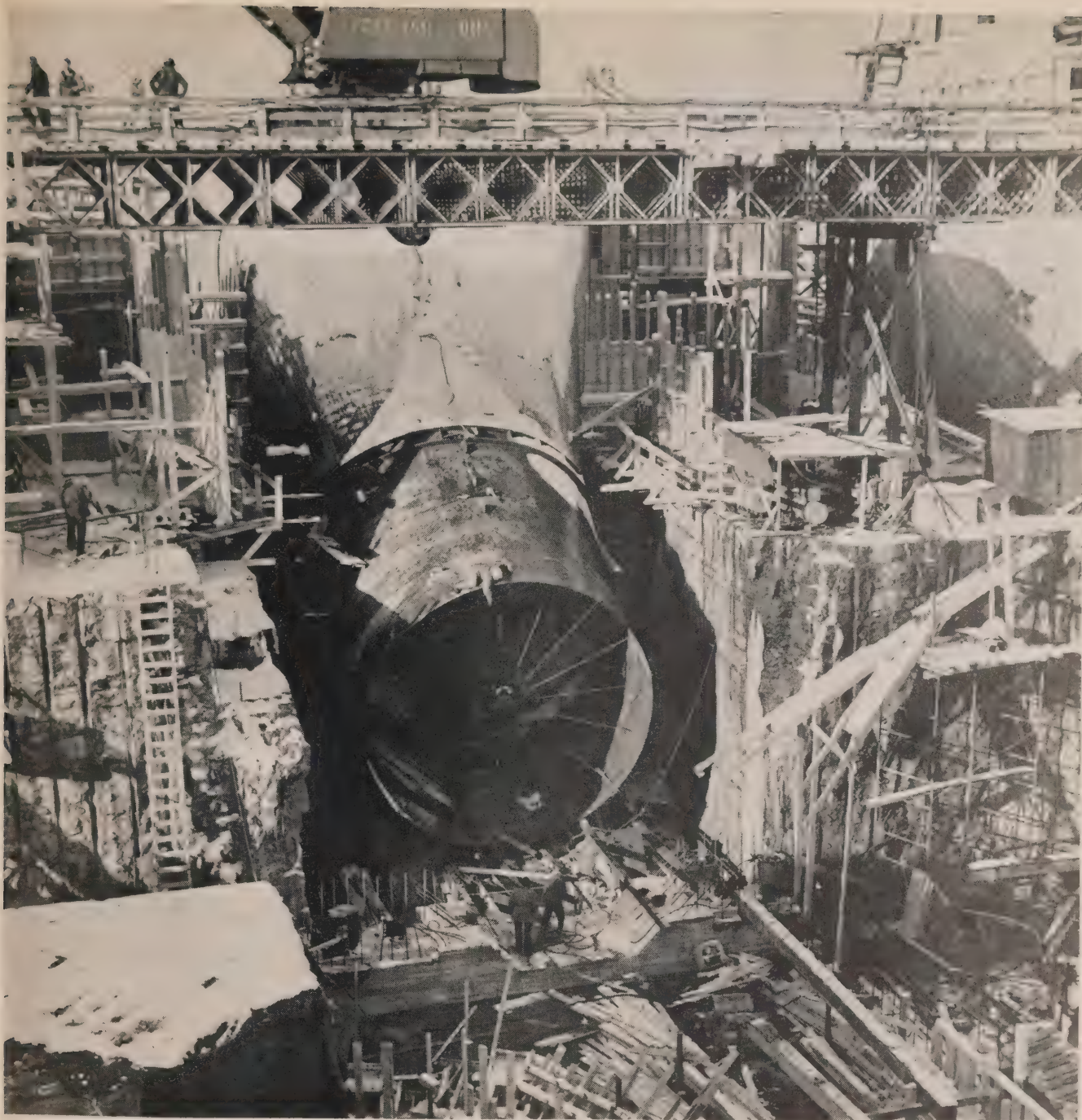
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## COVER SHOTS

TRAVELLING along a newly-completed stretch of Highway No. 2 west of Cornwall recently, a Hydro photographer was attracted by the icy but delicate dress of the roadside trees depicted on our front cover this month. The new section of highway diverts traffic north of Ontario Hydro's St. Lawrence powerhouse area, where flooding will occur during 1958 when the development is placed in initial service.

Equally wintry is the impressive aerial view of Hydro's Aguasabon Generating Station and the associated 240-foot surge tank on the shores of Lake Superior near Terrace Bay townsite.





## "PUMPING PENSTOCK"

WORK is advancing rapidly on the installation of six, unique units at the pumping-generating station associated with Ontario Hydro's Sir Adam Beck-Niagara Generating Station No. 2 development. At the head of the interconnecting channel, between the  $2\frac{1}{4}$ -mile long open-cut canal and the reservoir, a pumping-generating station is being constructed. Water will be pumped into the huge, 650,000,000-cubic foot capacity reservoir by six pump-turbines, which, when in reverse operation, will serve as turbine generators with a total installed capacity of 170,000 kilowatts. This photograph shows installation of a massive penstock for one of the units. Each penstock has a maximum inside diameter of  $26\frac{1}{2}$  feet.



# MOBILE LEVIATHANS

*By Frank C. Wood*

ONTARIO HYDRO is now the owner of four buggies, but they bear no resemblance to the "surrey with the fringe on top" of "Oklahoma" fame or the novel, perambulatory devices which are so popular with Canada's junior citizens.

They're mammoth affairs, weighing approximately five tons apiece, and in Hydro circles they have been given the name, "swamp buggies." These mobile leviathans are designed to carry up to four-ton loads over swamp or rough terrain that would be well-nigh impassable for ordinary trucks or even half-tracks.

Originally manufactured in Indianapolis, U.S.A., some 35 years ago for oil prospectors and drillers in the swamps of Louisiana, the present-day units are the product of a continuing process of mechanical improvement. Sometimes called "marsh buggies," the four vehicles now being used by the Commission have been further modified and im-

proved to meet the specifications prepared by Hydro's Transport Engineer, Douglas Simpson.

Influencing the Commission's decision to make use of these unique vehicles was the fact that they exert approximately  $4\frac{1}{4}$  lbs. pressure a square inch as compared with 15 lbs. by the human foot and 25 lbs. pressure by a normal three-ton truck.

Another factor favoring their use in Hydro's cross-country operations are the flotation properties of the buggies. This, in less technical phraseology, means the ability to pass through swampy country on their large, 18 x 26-inch power grip tractor tires. This size of tire was specified because it offers the advantages of comparatively low weight, low pressure and flexibility. As the largest available size in farm tractor tires, it is also lower in price because it is standard equipment and not a "custom" product. These

eight-ply tires cost approximately one-seventh of the price of large, special tires (up to 24-ply) used on heavy construction vehicles.

## Power Steering

Operation of the large vehicles has been facilitated by the installation of power steering mechanisms. Four-wheel drive and eight forward gears, as well as the heavy rubber treads enable the buggies to traverse wet or rough terrain as well as to climb steep grades at slow speeds without "bogging down" or stalling, while they can travel at 30 miles an hour over ordinary thoroughfares.

This is another favorable feature of the big "transports" as certain types of heavy, mobile equipment, such as bulldozers, must be carried over public highways by trailer trucks—involving additional expense and loss of time—to avoid damage to road surfaces.





**Hydro's monster new swamp buggies**  
**have proven adaptable to a variety**  
**of difficult, cross - country operations**

Travel over rough, uneven ground presents the hazard of overturning for many vehicles, but this danger has been minimized for the buggy by modifying the frame of each vehicle with the addition of a Willock Swivel frame. This permits turning at angles up to 25 degrees in either direction, the angle being purposely limited by heavy, permanently-fastened chains on either side of the frame. Additional equipment includes a winch on the front of each unit. The winch can withstand strains up to 15,000 lbs. enabling Hydro crews to pull the buggy over particularly bad terrain. It also can be used for rescuing other vehicles in difficulty or for removing stumps and other obstructions.

Each one incorporating the special characteristics laid down by the Commission, three of the buggies were in operation in each of Hydro's East Central, Georgian Bay and Northeastern Regions during the spring and summer months of 1955.

**Brush-Spraying Work**

Here they performed yeoman service with regional forestry crews in brush-spraying operations along transmission line right-of-way areas

(see *Ontario Hydro News* — September, 1955). Particularly adapted to cope with the oft-time difficult terrain encountered on transmission line routes, the buggies mounted 600-gallon tanks, supplying the spray trucks with the mixtures of water and chemical concentrate used in the control of woody undergrowth.

The fourth buggy, fitted with an auger for digging pole holes, is doing duty in the West Central Region, mainly on line construction. On certain occasions the auger will be removed and the unit put on spraying work, although brush control is not an acute problem in this region.

The East Central Region is using a buggy on line construction this winter as the units have proved capable of travelling through four feet of snow. The Georgian Bay Region is also operating a unit — in use all summer in the Northeastern Region — on dormant spray work.

Training personnel in the special skills needed to operate and maintain the vehicles has proved no problem for the Commission has been able to utilize the services of Earle

*(Continued on page 6)*



THE danger of overturning on rough ground has been minimized by modifying the frames of the buggies with a Willock swivel frame.



USED in brush-spraying operations in the East Central Region last summer, this swamp buggy supplied the mixtures of water and chemical concentrate to the spraying trucks.

have stake bodies, 8-feet wide  
feet long. Axles are mounted on  
uty springs and shock absorbers.

EQUIPPED with 8-ply power grip tractor  
tires and weighing about five tons each,  
the buggies dwarf ordinary automobiles.



# "INEVITABLE CONSEQUENCE"

ONTARIO Hydro's move to pool bulk transmission of 115-kv. power and to equalize the cost on a kilowatt basis throughout the Southern Ontario System "was an inevitable consequence of the development of the system."

This was the opinion expressed by A. W. Manby, the Commission's General Manager, in addressing delegates during the recent annual meeting of District 7 O.M.E.A. at London.

Tracing the history of rate assessment to municipalities, Mr. Manby pointed out that in the early stages of Commission operations, little difficulty was experienced in establishing the source of the power supplied to a particular municipality and calculating the actual cost of transmitting this power.

Coincident with the rapid growth of this network in recent years, it became necessary three years ago to equalize the cost of 230-kv. power throughout the Southern Ontario System. However, it has been possible, by adaptations of the earlier procedures, to continue the allocation of 115-kv. costs by divisions by arbitrarily assuming the source of power.

## Complex Conditions

As a result of the construction of large fuel-electric stations, the development of interconnections with neighboring systems and the complex operating conditions that now apply, it has been found unreasonable to continue to assume any particular source of power for a specified load.

With power flowing in several directions — at one moment supplied from a nearby fuel-electric source and at another from a hydro-electric source 200 miles away — the

former cost procedures no longer apply.

"In proposing to pool 115-kv. transmission and to equalize the cost on a kilowatt basis, the Commission is merely recognizing one of the inescapable facts attending growth and is adapting its procedures in conformity with it," Mr. Manby stated.

Continuing, the speaker pointed out that the date for implementing the revised procedure was postponed from the suggested date of January 1, 1955 to January 1, 1956.

"It should be noted, however, that new interim rates, based on the new, revised procedure were introduced in September, 1955," Hydro's General Manager explained. "Thus, the discrepancy between new interim rates and the calculation of cost on the old basis for the last three months of 1955 will, naturally, affect the financial adjustments, which are made at the end of the year."

## Resale Rate Structures

Referring to the assistance provided by the A.M.E.U. Rates Committee to Hydro's Rate Study Engineer, A. W. Murdock, in his study of the past three years pertaining to resale rate structures in the municipalities, the speaker said recommendations of this committee had been adopted in general by the Commission. The new rate structure would be implemented by the utilities as occasion permits, starting with Windsor and Niagara Falls in January, 1956, he stated.

The purpose of the revised rate structure is to eliminate a number of inequities and anomalies that have crept into the resale rates as the result of piecemeal adjustments over the years.

"In general, the new rate structures recognize the pattern of greatly increased domestic consumption for which the old-fashioned two-block structure is no longer suitable," the speaker observed. "They also recognize and aim to correct those situations where certain types of customers are, at present, bearing an undue share of the cost of providing service."

## Economic Progress

Reporting on developments, the guest speaker, referring to the fact that economic progress in 1955 gave Canadians considerable cause for satisfaction, pointed out that Ontario Hydro, as one of Canada's largest industrial enterprises, both shared in the year's prosperity and contributed towards it.

Quoting figures to illustrate the growth of Ontario Hydro and the vast amounts being spent on new developments and the borrowing which this progress entails, Mr. Manby said no difficulty is experienced in connection with financing. The public showed its confidence in the Commission by immediately taking up a \$65 million bond issue offered recently.

The extent of the increasing power demands was emphasized by the statement that the Commission's Southern Ontario System carried a total primary energy load of nearly 19 billion kilowatthours during 1955 — more than double the corresponding load in 1945. Mr. Manby outlined work being undertaken at the Sir Adam Beck-Niagara Generating Station No. 2, the Richard L. Hearn steam station in Toronto and at other points to meet this demand, making brief reference to the possibility of developing power from nuclear-electric sources.



## Ontario Hydro's General Manager Discusses Bulk Transmission of 115-kv. Power and Equalized Cost at District 7 O.M.E.A. Meeting



◁ THESE delegates: left to right, George Brown, R. H. Owen, Aylmer; Gordon Fuller, Windsor; J. A. Bowman, Ingersoll, and T. J. Moffat, Listowel, were noted discussing an engrossing topic.



◁ HYDRO'S General Manager, A. W. Manby, was chief speaker, discussing changes in wholesale and resale rate structures. H. R. Henderson, Woodstock, who presided, is seated on the left, V. A. McKillop, London, right.



◁ HANDLING registration at the well-attended meeting, B. W. Grover, Frank Wilkinson (seated left to right), check in three London delegates: left to right, E. W. Oddleifson, E. A. Jones, W. A. Pottruff before the sessions.



◁ OFFICERS elected for 1956 included: left to right, M. L. Logan, Thorndale; George Brown, Aylmer; V. A. McKillop, London; H. R. Henderson, Woodstock, P. R. Locke, St. Thomas. J. S. Killingsworth, London, re-elected President, was not present, due to illness.

Discussing frequency standardization, Mr. Manby paid tribute to the gratifying cooperation of utilities and customers, stating that 101,259 services were standardized, in addition to the equipment of 28,003 customers who moved from 25-cycle to 60-cycle areas, during 1955.

During the business session, J. W. Peart, P. Eng., St. Thomas, Chairman of the A.M.E.U. Employee Relations Committee, in recommending that a resolution be submitted to the annual meeting of the O.M.E.A.-A.M.E.U. asking that the services of a firm of industrial consultants be made available to utilities, pointed out that the number of working agreements between Ontario municipal utilities and trade unions had increased from 14 to 28 in a period of five years.

Stressing the vital necessity of utilities being provided with up-to-date information concerning wages, fringe benefits and working conditions, not only in other utilities, but also in related industries, Mr. Peart suggested that when a utility is about to negotiate a new agreement with its staff, a consultant should be available to provide information and advice to utility officials. Emphasizing the importance of good working relationships between utilities and their staffs, Mr. Peart stated that it would be costly to hire the services of industrial consultants, and because of this it would be necessary to impose a levy upon member municipalities to meet the cost of these services.

### Hydro Jubilee

President J. S. Killingsworth, of London, who left a sick bed to welcome the delegates, touched upon

*(Continued on page 6)*

Hydro's Golden Jubilee in the course of his brief address.

"Hydro this year is celebrating its golden anniversary and I think a district O.M.E.A. meeting in London is the happiest place where some celebrations could be planned. I say London," Mr. Killingsworth remarked, "because the late Sir Adam Beck, so often called the 'Father of Hydro,' lived and worked here for many fruitful years." It was the pressure of the municipalities, Mr. Killingsworth continued, who rallied around Sir Adam and lent him strength in his successful, but not always easy battle for the necessary legislation to establish a provincial Hydro body. These municipal groups were, of course, the O.M.E.A. in embryo. The "father" had a family, who supported him even before Ontario Hydro became a reality.

"Sir Adam well deserves that monument on University Avenue in Toronto, but we, in London, think that such things as the Beck Memorial Sanitorium, the beach park at Port Stanley, the two schools named after him and Lady Beck, the contribution he made to Victoria Hospital and the boost he gave our London waterworks by his faith in our well system, are monuments which, today, are living testimonials to London's appreciation of one of its greatest citizens.

"Just last year a dream of Sir Adam's that a street light would, one day, be set on every Hydro pole in London came true."

O.M.E.A. President A. A. Kennedy, discussing the Jubilee, said: "It is our job to tell our customers the full story of an experience in public ownership unique in the world" and suggested that the celebrations should be a year-round proposition. He added that there would be a program in Kitchener on May 14 and that the Ontario Government planned to hold a dinner at the Royal York Hotel, Toronto, in connection with the jubilee.

After discussion from the floor, it was unanimously agreed that Dis-

trict 7 record its support of the observance of the 50th anniversary and that a special committee be formed of three members from this district, and three each from the O.M.E.A., A.M.E.U. and Ontario Hydro to make plans for specific observances.

### Election Of Officers

Turning their attention to the election of an executive, the delegates expressed confidence in those officers who acted in 1955 by re-electing four to serve again, the 1956 slate being: J. S. Killingsworth, London, President; H. R. Henderson, Woodstock, 1st Vice-President; P. R. Locke, St. Thomas, 2nd Vice-President; G. E. Brown, Aylmer, and M. L. Logan, Thornedale, Directors, and V. A. McKillop, London, Secretary-Treasurer.

Mr. Henderson, who acted as chairman after Mr. Killingsworth had left the meeting, suggested there should be a change of venue for next year's meeting, requesting that member utilities send invitations to hold the 1957 meeting in their municipalities.

In connection with future meetings, O.M.E.A. President Kennedy suggested that foremen and senior linemen be present to permit them to learn from the experience of other people in the same occupation. He also asked that support be given to the district body of the A.M.E.U. formed in London.

Reporting on membership, V. A. McKillop said 28 utilities are members of District 7 and asked for ideas on how eight non-members might be induced to join.

In another phase of a well-varied agenda, a panel comprising Gordon Fuller, J. W. Peart, F. T. Julian and P. R. Locke, with W. Ross Strike as chairman, discussed the Ontario Hydro annual report, sometimes known as the "Blue Book."

Questions and answers revealed much important information concerning this publication, including the fact that it has been continuously published since 1908 and

copies are distributed to many parts of the world.

Mr. Peart said he considered the municipal financial statements of great value, while Mr. Locke suggested commissioners should familiarize themselves with these statements, as well as those concerning the increase in Hydro's assets and funded debt.

Mr. Fuller commented that the report on rural development indicates that rural growth since the war is almost miraculous, while Mr. Julian expressed approval of the section dealing with municipal services and that covering engineering developments.

Concluding the panel, Mr. Strike expressed the hope that the discussion would encourage more members to become interested in the annual report, which includes complete reports on every phase of Hydro activity. Most utility managers refer to the report quite frequently, he stated, urging local commissioners to familiarize themselves with all aspects of Ontario Hydro organization and operations in view of the wide-scale program of expansion.

### "MOBILE LEVIATHANS"

*(Continued from page 3)*

Luck, a mechanic at the Central Garage, who is not only adept at handling and servicing the buggies, but also has the gift for imparting his knowledge and skill to other drivers and mechanics.

The new vehicles have won the approval of Commission personnel charged with their operation and maintenance. During a recent test of one buggy witnessed by Canadian and U.S. Army representatives, one senior U.S. Army officer said he was "very impressed" with its performance.

And so these "gargantuans on wheels" have joined Ontario Hydro's fleet of some 3,560 vehicles serving the Commission and its customers in every section of the province.



# LEAMINGTON MEETING

**D**ISCUSSING Ontario Hydro's decision to pool bulk transmission of 115-kv. power and to equalize the cost throughout the Southern Ontario System, Vice - Chairman W. Ross Strike told delegates at the recent annual meeting of District 8 O.M.E.A. that it is now impossible to "tag a kilowatt."

"Owing to system interconnections, no one really knows the actual source of power," Mr. Strike pointed out. "It is felt that by equalizing the cost of bulk transmission of 115-kv. power, no undue inconvenience to any municipality will result."

Discussing Hydro's Golden Jubilee this year, the speaker said the observances "will provide us with the opportunity of emphasizing the significance of Ontario Hydro and the local commissions and of stressing the cooperative nature of the whole movement."

## Standing Tribute

Meeting at Leamington for the first time, delegates paid a standing tribute to the memory of the late Warren P. Bolton, a well-known Windsor Commissioner and O.M.E.A. member. President Stanley G. Thomson said Mr. Bolton was Vice-President of the district association at the time of his death and had been one of the most active members of the O.M.E.A.

During the business session, concern was expressed at the heavy loss of life, which had resulted in recent months from fires in homes. William Anderson, Windsor, suggested that faulty wiring might have been responsible for some of these fires. He suggested that attempts be made toward publicizing the hazards of improper wiring to ensure that Ontario electrical customers follow the regulations pertaining to

inspection of wiring installations and the use of proper fusing.

Secretary R. S. Reynolds, Chatham, expressed the belief that all these recommendations are included in utility rule books. It was decided that delegates seek the cooperation

*(Continued on page 8)*



△  
DISCUSSING utility problems: left to right, H. C. Paillefer, Windsor; Kenneth Omstead, Leamington, Mayor William Poulter, Cottam, apparently reached agreement on one point.



△  
A. W. MURDOCK, Hydro's Rate Study Engineer, left, explains charts he used with his address on resale rate structures for local utilities to J. L. Graham, Leamington, and J. F. Cook, Windsor.



△  
FOLLOWING the general meeting, members of the 1956 executive conferred briefly. Seated left to right - J. T. Barnes, Sarnia; Gordon Fuller, Windsor, President; M. J. Brian, Windsor; standing - Roy Warwick, Blenheim; Thomas Cada, St. Clair Beach; J. E. Teckoe, Jr., Windsor.

of the press and radio in their municipalities in drawing public attention to the danger of improper fuses and wiring.

Introduced by J. E. Teckoe, Jr., Windsor, Ontario Hydro's Rate Study Engineer, A. W. Murdock, discussed municipal rate structures. Illustrating his subject by means of graphs, Mr. Murdock drew attention to the fact that there are over 200 domestic rates in the province. This has produced many differences between similar customers in various municipalities.

The new rate structures will provide a more equitable distribution of cost among the various types of customers in each of the domestic, commercial and power classifications, as well as a more realistic coordination between classes. It is also proposed that commercial customers with connected loads of less than 5 kv. be billed at the domestic rate.

#### **Schedule Praised**

In discussing the wholesale Hydro rates, J. T. Barnes, Sarnia, pointed out that in 1920 there were 179 "cost" municipalities in southern Ontario. A total of 60 municipalities were paying between \$50 and \$90 per horsepower per year. As a result of a resolution introduced by Sarnia and approved by District 8 members in 1943 and by delegates at the annual O.M.E.A. convention in 1944, Ontario Hydro did make adjustments in rates, but did not establish a flat rate as it was deemed impracticable at that time.

Mr. Barnes said that, owing to load growth, the purchase of larger blocks of power and new sources of generation, the average cost of power should no longer be computed in terms of distance from Niagara Falls, but should be considered on a sound, provincial flat rate with minor exceptions.

In 1950, Sarnia presented another resolution on equalized wholesale rates to District 8, which was accepted and presented to the annual O.M.E.A. convention in Toronto in

1950. The resolution provoked a spirited debate and was overwhelmingly approved.

Mr. Barnes considered Ontario Hydro has come close to equalizing Hydro rates by setting up a new schedule of interim rates effective as of September 1, 1955. He stated that, in spite of the desire to introduce a truly uniform rate to all municipalities, it must be recognized that there are certain conditions, such as load factor, high - tension step-down, low tension step-down, low tension distribution, frequency standardization, direct charges and share of regional services, which prevent it from becoming an actuality.

He said he brought this matter to the attention of members because there are some municipalities, which are not in accord with the decision to pool 115-kv. transmission costs, and might try to oppose it at this year's O.M.E.A. meeting in Toronto.

"This will be your cue to support your own theory of power costs and hold the line as now established, which is very much to your own advantage," Mr. Barnes recommended.

C. S. Phelps of Sarnia, Western Region Director of the A.M.E.U., suggested that the scope of the A.M.E.U. be broadened by forming a district association to include people who do the actual work, such as foremen and office men, as they would be able to exchange information on matters of mutual interest, including the four - block rate structure.

#### **Jubilee Observances**

On the subject of Hydro's 50th anniversary, O.M.E.A. President A. A. Kennedy, Ontario Hydro Commissioner, paid tribute to the far-sightedness of a group of municipalities in the Kitchener and London areas in laying the foundations of the province-wide enterprise. A committee comprising representatives of the O.M.E.A., A.M.E.U. and Ontario Hydro has been formed for the purpose of tell-

ing customers the story of Hydro and the jubilee celebrations would commence at the O.M.E.A.-A.M.E.U. annual convention. The O.M.E.A. is to sponsor a luncheon in Kitchener on May 14 to commemorate legislative approval of the enabling acts creating the provincial Commission. Ontario Hydro's Information Division, he said, could supply a wide variety of material, including leaflets for children, films, and material for addresses to local service clubs, etc., in municipalities wishing to sponsor local jubilee observances.

Concerning the municipal annexation problem, which had been discussed at great length recently, Mr. Kennedy said it had been decided to ask certain municipalities to instruct their auditors to prepare briefs on their views concerning the advisability or otherwise of the creation of a sinking fund. These briefs have now been presented by the auditors and will be examined by the committee concerned with annexation.

The election of officers put Gordon H. Fuller into the presidential chair, an office which will not be strange to him, for on four previous occasions, he has been President of District No. 8. Other officers named were: J. T. Barnes, Sarnia, 1st Vice - President; Roy Warwick, Blenheim, 2nd Vice-President; Directors — M. J. Brian, Windsor; Thomas A. Cada, St. Clair Beach; T. D. Odette, Tilbury; Secretary-Treasurer, J. E. Teckoe, Jr., Windsor.

Mr. Barnes, in acknowledging his election as First Vice-President, extended an invitation to hold next year's meeting in Sarnia.

Retiring President Stanley G. Thomson expressed pleasure at the attendance of more than 100, and thanked his executive for their work during the past two years, while Secretary-Treasurer R. S. Reynolds reported that only two eligible municipalities are not members of District No. 8. —by Frank C. Wood.



# FIRST CONCRETE

Important milestone reached marking turning point from excavation to construction at Ontario Hydro's St. Lawrence development

**J**UST 18 months after the official sod-turning ceremonies, the first concrete was placed at Ontario Hydro's St. Lawrence powerhouse during the week of February 13-17.

Months of excavating in the bottom of the north channel of the river preceded the commencement of concreting operations. A Commission contractor has been digging in the north half of the channel between the Cornwall canal bank on the Canadian mainland and the international boundary, while the U.S. forces have been working from that point to Barnhart Island. Both groups have been excavating down to bedrock to provide a solid foundation for these principal structures—the powerhouses—which will have an estimated total weight of more than four million tons.

A conception of the magnitude of the building task in the powerhouse area alone is revealed by an estimate of the total amount of concrete for the Canadian structure. Approximately one million cubic yards of concrete will go into the powerhouse with about the same into the U.S. structure. In terms of railway carloads, the combined concrete total for the two powerhouses would make up a train that would stretch for about 1,000 miles, the distance from Cornwall to Fort William.

Concrete for the Ontario Hydro powerhouse will be produced in the large batching and mixing plant which stands on the north shore of the river, towering above the powerhouse excavation. Four thousand tons of concrete on the average will



△  
FRED ST. LOUIS, chief operator of the fully-automatic batching and mixing plant established at the site of Hydro's St. Lawrence powerhouse, is shown seated at the control panel.

be discharged out of this plant every workday for the next two and a half years. The plant is completely automatic and its history as well as the function are interesting.

## Interesting History

Now owned and operated by Iroquois Constructors, this 200-cubic yard per hour batching and mixing

plant has seen much service on major power development construction jobs. Before being transported to Cornwall, the concrete plant served Ontario Hydro's new Sir Adam Beck-Niagara No. 2 project at Chippawa to produce the concrete required for the intakes and for sections of the lining of the twin power

*(Continued on page 10)*



△ APPROXIMATELY one million cubic yards of concrete will be produced in the large plant.

tunnels. Prior to that the plant had been in operation at the Commission's Otto Holden Station north of Mattawa, on the Ottawa River, and before that had produced concrete for Ontario Hydro's Stewartville development on the Madawaska River. After serving the latter project, the concrete plant was revamped, being enlarged to accommodate four instead of three mixers.

This central mixing plant has many unique features. It provides fast, accurate, automatic weight batching; compensation for variations in sand and fine gravel moisture content; instantaneous mix changes with a mix selector; inter-

locking operations to prevent errors; centering of all controls on one control board and complete detailed records of every batch poured.

A rock quarry, owned by the Commission and operated by C. A. Pitts Ltd., will supply the three sizes of coarse aggregate and manufactured sand for making the concrete. The powerhouse contractor will procure these aggregates from the quarry stockpiles, located near Cornwall Centre about three miles north of the powerhouse site, and a fleet of trucks will transport the material to hoppers at the north end of the tunnels under Cornwall canal. The hoppers will drop the aggregates on

AN INTRICATE and extensive conveyor system has been set up to carry materials to the mixing plant, left background. A re-screening system, foreground, will ensure clean aggregate.





to belts, which will convey the material through the tunnels to small reserve stockpiles near the mixing plant on the south side of the canal. From there, conveyors will take the material to hoppers at the top of the batching and mixing plant as required.

Cement will be brought into the area by railway cars to a siding near No. 2 Highway where it will be unloaded into a surge silo. From there it will be blown in a six-inch steel pipe extending through the tunnel under the Cornwall canal and up into two storage silos adjacent to the mixing plant. As required the cement is brought into the mixing plant by bucket conveyor.

Operation of the concrete plant will be under the direction of three experienced men formerly Ontario Hydro personnel, now with Iroquois Constructors. Howard Harrison is plant superintendent; Eddie Jordan, foreman in charge, and Fred St. Louis, the chief operator. Keeping a close check for the Commission on the quality of concrete output and the placing of it in the main dam and powerhouse will be a capable crew of concrete inspectors on the staff of Neil Mustard, Hydro's concrete control engineer. These include Bill McIsaac, Ray Harris, Tom Chesney, Johnny Newstead, with whom will be associated several junior inspectors.

#### Automatic Control

Speeding up of powerhouse construction is made possible because of the high production from such automatically-controlled concrete mixing plants. With the mechanism set for the quality and type of concrete required, the operator at the control board turns a switch and the aggregates, cement and water flow freely into a set of bins and are automatically weighed. When the exact proportions required are assembled, the flow automatically closes off, the materials descend and come together in a circular collector cone. From there they pass through

a motor-driven swivel chute into one of the four mixing machines acting in series. When the mixers have done their job and the concrete is poured into hoppers, the operations begin all over again, continuing until the entire run is completed.

From the mixing plant the concrete is dumped on to conveyor belts and taken to a large hopper, where it is loaded in trucks equipped with special buckets or into buckets on narrow gauge railway cars, which will be hauled by small diesel engines. The trucks will proceed to the area where pouring operations are under way and mobile cranes will lift the buckets containing concrete

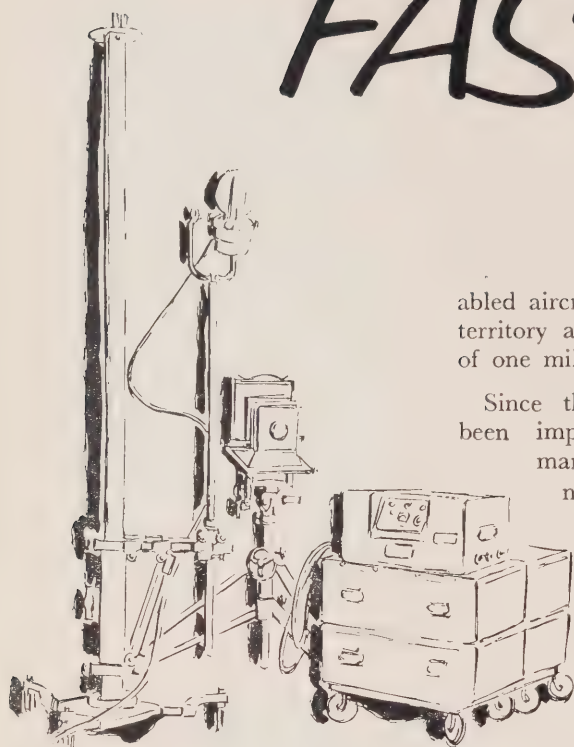
over to the forms and discharge the contents. The small railway cars will run between three large cranes, where the crane boom will pick up the buckets from the cars and dump the concrete into the forms. These forms are heavily-constructed large panels of durable plywood.

Concreting operations will continue at an accelerated rate around the clock, with crews working in three eight-hour shifts. The pace will not slacken despite winter cold or summer heat. Men and machines will make every effort to meet the tight work schedule, which involves placing the first units in the Ontario Hydro powerhouse in service by mid-1958. ■

VIEW of the quarry near Cornwall Centre where various sizes of aggregate to be used in concrete manufacture are stockpiled. A mobile stacker is shown in operation on the right.



# FASTER THAN



By Frank C. Wood

**E**LECTRICITY already serves man in many hundreds of ways, but scientists and engineers, through continuous research, are discovering additional methods by which this mighty force can be harnessed for new applications. One of the latest electrical devices — known as a flashtube — is finding many new uses in photography and certain types of research.

Today, many photo-engraving and graphic art firms in Toronto and other large cities of the province are using these flashtubes and the associated equipment.

Much of the early work in connection with the gaseous discharge tubes was carried out during World War II by Dr. Harold E. Edgerton and his associates at the Massachusetts Institute of Technology. The result was a flashtube, which en-

abled aircraft to photograph enemy territory at night from an altitude of one mile.

Since the war, flashtubes have been improved and applied to many peaceful uses, revealing new potentialities of achievement, particularly in the field of color photography. Pictures which appear to have been made in the open air, may now be made under the controllable conditions of a studio, thus rendering the professional photographer independent of the vagaries of the weather for some of his shots.

## Additional Applications

In addition to their uses in amateur and professional photography, flashtubes are also being widely employed in the solution of clinical and industrial problems, enabling lines of research to be undertaken far beyond the visual limits of the human eye.

Many forms of sudden impact or stress, such as glass shattering or a bullet striking a target, can be studied, while rapidly-moving machinery can be inspected during operation. Forces and currents of air around speeding planes, bullets and other projectiles can be observed, and microphotographs of tiny moving organisms can be made without fear of overheating and perhaps destroying the specimen.

A simple illustration provides a conception of the power of these

flashtubes. Perhaps this article is being read with the aid of a 100-watt bulb, giving a light output of about 1,500 lumens. This is but a pale glimmer compared with the output of a million-lumen flashtube—some 666 times greater than the 100-watt lamps.

Flashtube illumination is distinguished by certain fundamental characteristics:

## High Light Intensity

Extremely high intensities of light are possible (flashtubes producing up to a billion lumens at the peak of the flash were used over the Normandy beachhead prior to the World War II invasion), while flash durations are much shorter than the exposure times of even the fastest commercial camera shutters, ranging from one-thousandth to one-millionth of a second:

The same flashtube can be flashed repeatedly — from thousands to millions of times: Flashtubes can be flashed repetitively at frequencies as high as 10,000 flashes per second. (Under such conditions each flash duration is reduced to a few millionths of a second).

These light sources produce a flash of very short duration, resulting in sharply defined photographic negatives, even if there is movement of the subject or vibration of the camera. In the photographic studio, discomfort from the irradiated heat and the brightness of high-wattage flood and spot lighting is eliminated by their use.

Flash characteristics of flashtubes



# LIGHTNING

Developed during World War Two, electrically-operated flashtubes are finding many important applications in Ontario today

differ in important respects from those of photo-flash lamps. For example, unlike photo-flash lamps, whose output is fixed at the time of manufacture, the output of a flashtube depends upon the amount of electrical energy delivered to it.

Flashtubes operating on alternating current require: a step-up transformer to raise the line voltage to the voltage necessary for flashtube operation; a rectifier to convert the high-voltage direct current for charging the condenser; enough condenser capacity (microfarads) to provide the desired light output from the flash; a small amount of resistance in the condenser-charging circuit, or leakage reactance in the power transformer to limit the peak-charging current of the condenser to a safe value for the transformer and rectifier; resistance across the direct-current part of the system to provide intermediate d-c voltages for the triggering circuit, and to dissipate any unused energy after flashing and finally a triggering circuit, to start the flash.

Flashtube applications in the fields of graphic art and industrial, medical and scientific research are thus providing yet further examples of the never-ending diversity of the uses of electrical power in the service of humanity. ■



REGARDED as the latest photographic lighting device, the flashtube, with its associated equipment, is being used extensively by Ontario photographers and engraving firms.

(Courtesy of Photo Engravers and  
Electrotypers Ltd., Toronto)





# 25 NEW MEMBERS

**Toronto Hydro**

**Quarter-Century Club**

**Annual Dinner**

**Has Record Attendance**

**A**TTEendance of 491 retired staff members and long-service employees of the Toronto Hydro-Electric System at the 28th consecutive annual banquet of the Quarter-Century Club recently, created a new, high record.

Extending a welcome to the members, President Stuart Cramp revealed that membership of the club, including 245 retired members, now totals 834.

"It is something of a coincidence"

he said "that tonight the Quarter-Century Club should be welcoming exactly 25 new members — three ladies and 22 gentlemen — who, during the past year, have completed 25 years' service with the system. To you, ladies and gentlemen, we extend the very best wishes for the future, and hope you will have the pleasure of attending many more banquets of the club."

President Cramp also congratulated seven members who have com-

THESE smiling members of the Toronto Hydro staff, including: First row, left to right — Frank Thompson, John Winnett, John H. Bartlett, William J. Mick; Second row — William T. Mansley, Edward Walker, Thomas Cromie, Misses Ella Tracey and Effie Wall-

ace, Edwin Phillips, Frederick Galloway, Alan Still; Third row — Douglas Bremner, Reginald Smith, George Wright, John Fortune, James Bryan, Ernest Bartholomew, John Lambie and John Berry were among those entering the quarter-century ranks during 1955.





pleted 40 years' service. "That is a marvellous record to consider, testifying, as it does, to the progress of the staff and the Toronto Hydro-Electric System," he stated.

Toronto Hydro Chairman Bert-ram Merson, in his brief address, said it spoke well for morale that so many present and former members of the staff should come together to discuss old times and enjoy a pleasant evening in each other's company.

Brief addresses were also made by Vice-Chairman John McMechan and General Manager H. J. Mac-Tavish.

Assistant General Manager John S. McGregor, who has 45 years' service to his credit — and whose numerous friends often jocularly predict will soon be appointed to the permanent staff — presented 40-year pins to Edward A. Chapple, Peter Ferraro, John H. Gordon, Fred W. Jarvis, George L. Tomlinson, Samuel J. Smyth and George H. Williams.

Twenty-five year pins and appropriate congratulations from Mr. Merson went to: Miss Ella Tracey, Miss Effie Wallace, Ernest A. Bartholomew, John H. Bartlett, John E. Berry, Douglas J. Bremner, James P. Bryan, Thomas A. Cromie, John J. Fortune, Frederick Galloway, John P. Lambie, William J. Mansley, William J. Mick, Edwin F. Phillips, Reginald E. W. Smith, Alan R. Still, Frank A. Thompson, Edward Walker, William J. Williams, John Winnett and George L. Wright.

Not present because of duty or other cause, Miss Verna E. Lucas, William A. Kirkwood, Frank J. Farley and Robert Hopkiss, will receive the 25-year accolade at a later date.

Mathematically-minded members of the club have calculated that the combined service of honorary, retired and active members at nearly 18,000 years, would extend far back beyond the recorded history of the human race.

The formal program was pleasantly rounded off by entertainment, under the direction of J. Rennie, the artists being Eddie Dowie, xylophonist; Laurie Stewart, unicyclist and juggler; Bruce Webb, bass soloist and M.C.; Nancy McCaig, accordionist, and Juliette — "Everyone's Pet Songstress."

The excellence of the arrangements that resulted in this successful evening evidenced the hard, behind-the-scenes work of President Stuart Cramp, Secretary A. A. (Bert) Gibbs, Honorary Secretary Norman I. Fisher, Treasurer Lloyd Lillicrop and the 36 members of the Toronto Hydro Quarter-Century Club Committee.

One solemn event occurred when members stood in silent tribute as the lights were dimmed and Secretary Gibbs read the names of mem-

bers and retired personnel, who had died during the year, these being, Members: Edwin C. Attwood, Gilbert S. Burrows, Harry Glockman, Albert Salisbury, John A. Simpson, William G. Souter, William Stewart, Charles W. Thomson, Joseph B. Wilson; Retired personnel: Walter C. Burch, Irion G. Carter, Lewis Edwards, Frank V. Holmes, Albert Kay, Charles W. Kent, Harry Lawson, Henry Luckhurst, Alexander McDougall, William J. McGrogan, James S. Millican, Alexander Roy, Mrs. Alice Stewart, William Waters, James P. Wilson and Thomas Woodhouse.

In paying tribute to their memory, Mr. Gibbs referred to the coincidence that 25 new members were admitted and 25 members died during the past year.

— By Frank C. Wood.

THIS group, left to right: Club Secretary A. A. Gibbs, President Stuart Cramp and Toronto Hydro's Assistant General Manager, J. S. McGregor are discussing the program.



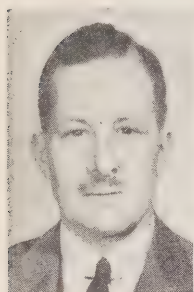
MEMBERS of this happy sextette: First row, left to right - John H. Gordon, Edward A. Chapple, Samuel J. Smyth; Second row - George H. Williams, Peter Ferraro and Fred W. Jarvis were presented with 40-year pins.



# Utilization Voltages

By R. E. Jones\*

*This article is based on a report presented at a recent committee meeting of the Canadian Electrical Assoc. in Toronto.*



R. E. Jones

THE rapidly increasing loads on electrical supply systems in recent years have taxed the capacity of many of our distribution systems. We must either spend a lot of money to reinforce the system in its present form, or revise the design to a more economical plan.

One part of the distribution design, which might well be considered first, is the secondary system from the transformer to the utilization equipment on the customers' premises.

The first public supply system started by Edison used a 3-wire direct current system at 110/220 volts. At a later date, 240/480 volts were used in some places to supply power loads.

When alternating current was first used for lighting, many systems started at 50 to 52 volts, as this permitted the use of a lamp with a less fragile filament.

However, the use of this extremely low voltage necessitated the installation of a transformer on each pole, and it was soon abandoned in favor of 110/220 volts. Through the years, the voltage has crept up to 115/230, and now 120/240 is com-

monly used for domestic and commercial lighting service.

In large urban systems, a 3-phase wye network is often used to supply combined lighting and power service at a voltage of 120/208.

For larger power services, voltages of 480 delta are in general use in United States. In Canada, there are a few services at 480 volts, but 600 volts is used mainly.

In Europe, Asia and Australia, a wye system of 240/416 is in general use. In Africa and South America, both 240 and 120 volts are used. Intermediate voltages in odd places are 100, 105, 135 and 150 volts.

About 1909, the Toronto Electric Light Co. installed a limited number of services supplied off its 240/480-volt direct current system. These supplied office buildings and small apartment blocks.

At this time, domestic appliances were starting to become popular and lighting was mostly with carbon filament lamps with the tungsten lamp just starting to be used. Even at 110 volts, the latter had a filament that was easily broken by a slight jar.

The experiment was successful, but the results were not encouraging. While both the utility and the builder saved money on conductors, appliances for this voltage were difficult to obtain and higher in price and tungsten lamps were too fragile. Another condition, which was greatly aggravated by the system being direct current, was encountered when switching off appliances. Irons and toasters were usually supplied from a ceiling or

wall fixture and when they were turned off by means of the key socket, there was arcing and frequently the socket was completely destroyed.

In the past few years, consideration has been given in the United States to the use of a higher secondary voltage and some installations have been made, using spot networks. Several papers have been written on the subject.

The most popular voltage suggested is 277/480 with advocates for 265/460, 250/433 and 240/416.

Other voltages suggested, but not considered seriously, are 332/575, 360/720 single phase and 360/624.

Advantages of the use of one of the above voltages are as follows:



△  
REPRESENTING an era of electrical distribution long outmoded in Ontario, this "Leaning Tower of Pisa" contrasts strangely with the modern facilities on the opposite page.

\*(Mr. Jones is Distribution Engineer, Ontario Hydro.)





DISTRIBUTION systems in Ontario must be ready to cope with expanding loads and complex voltage requirements as the number of domestic and other appliances continue to increase.

*For the Utility:* Saving in copper in secondary bus and lower losses; installation of fewer transformer vaults and transformers; lower cost for capacitor banks.

*For the Customer:* Lower wiring costs, particularly in old buildings where increased load would otherwise necessitate new risers; better starting torque on appliance motors which are usually built to utilize entire capacity of motor; use of 440-volt motors off same circuit as lighting; use of standard, 265-volt fluorescent luminaires; better voltage regulation and reduction in flicker.

On the basis of load doubling each 10 years, assuming no replacements, the present appliances will amount to only 25 per cent of those in use at this later date.

The disadvantages appear to be mainly to the customer and are as follows:

If 240/416 volts is used, there will be the same difficulties with 440-volt motors as have been experienced with 220-volt motors on 208 volts.

If apartments have 240 volts and single residences 120 volts, there will be endless confusion.

Lighting fixtures are built for 120-volt use only. The same applies to many wall switches.

The Canadian Wiring Code requires a maximum of 150 volts to ground for many installations. The omission of the ground on the neutral would be a step backward from the safety angle.

Incandescent lamps are less efficient on 240 volts. A 100-watt, 1,000-hour lamp gives 15.4 lumens per watt at 120 volts and 12.4 lumens at 240 volts.

Appliances would probably cost more due to extra insulation. There

would have to be more grounding of appliances as is the practice in Europe on 240 volts. There would probably be a requirement for fused attachment-plugs similar to those in use in England. If auto transformers were used to reduce the voltage, part of the regulation saved by higher voltage would be lost due to added regulation of transformers. And last, but not least, there is the shock hazard. Under dry conditions, a 120-volt shock is normally not harmful, but doubling this voltage would make the ordinary accidental contact very hazardous.

This has been merely a review of the subject, without recommendation for or against. In the words of L. G. Smith of Baltimore, we should remember that in the electrical industry, the principal mistakes that have cost us money have been lack of vision and lack of faith in the future. ■



# ELECTRONIC BRAIN

**ALTHOUGH** few people realize it, Toronto has a giant electronic brain, which controls most of the long-distance telephone calls between 40 Ontario centres and many towns and cities in Canada and the United States.

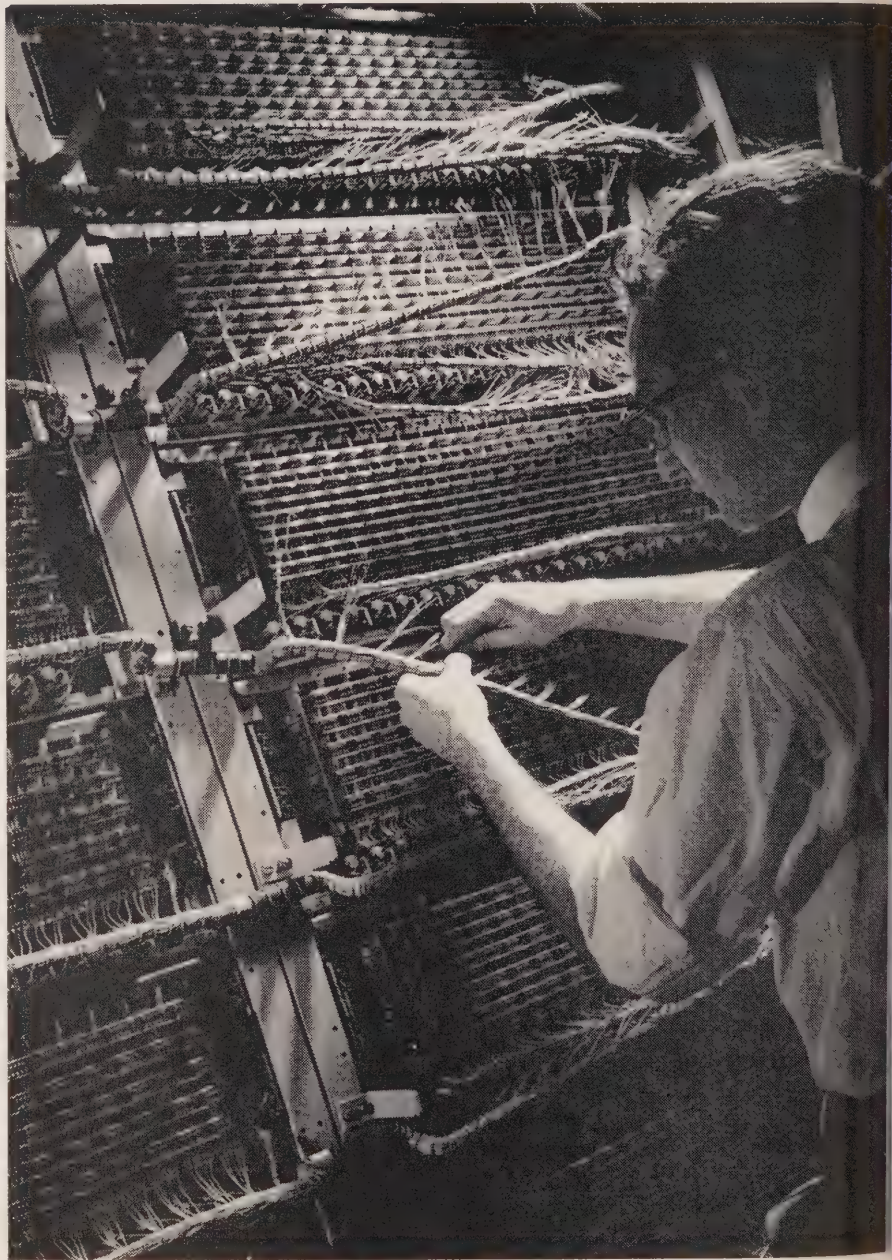
Technically known as the Toronto 4A crossbar system, the "brain" is located on the top three floors of the Bell Telephone Company's building at 76 Adelaide St. West in Ontario's capital city.

The crossbar equipment does much of the work formerly done by the operator. She received information about a call, checked the routes available, set up a circuit to the called city and sent the call to its destination. Meanwhile, she would record the information about the call on a ticket.

Now, in most cases, the operator accepts the call, determines the routing to the area and sends the call on its way. The crossbar equipment does the rest . . . switches the call through to the proper exchange and telephone, causing it to ring.

This unique Toronto equipment, the first installed in Canada, is one of almost 100 machines to be established throughout North America. At the present time, the equipment is directly connected by 1,500 circuits to 90 Canadian and U.S. long distance centres. Montreal is to have the second 4A crossbar point (now being installed), which will act as the regional switching system for Eastern Canada while Regina has been selected as the Western regional centre.

The Toronto system was years in



SOME 180 skilled technicians worked for approximately a year installing the Toronto crossbar system. More than three million feet of wire were used to make the cross-connections.



# N

**First 4A Crossbar system installed in Toronto is the forerunner of a vast North American telephone exchange**

the planning stage, while rearrangement and preparation of the necessary facilities in 90 Canadian and U.S. centres took approximately two years. Actual installation of the Toronto mechanism by 180 skilled technicians was completed in a year. The "brain," weighing some 225 tons or more, was hoisted 15 storeys to the top of the Bell building in Toronto, while more than 3,000,000 feet of wire were required to make the cross-connections.

The "thinking" process of this machine enables it to receive each long distance number with its three-figure long-distance code; remember the number while it forwards the code to an electronic card index which finds an available route; then send the call on to its destination and wait for another call. The whole operation takes place within a second or two, and all automatically.

The crossbar equipment will play an even bigger role under direct customer dialing. It will accept the call, look up the route with an electronic card index, "remember" — while it is selecting and trying routes — the 10 digits dialed, and then, when the call is on its way, it will start on a new one without even a pause for breath.

With the direct customer dialing system in full operation, telephone users will be able to dial their own long distance calls right across the continent just as they now dial local calls across a city.

Direct customer dialing — or Direct Distance Dialing as it's known technically — will be introduced in Windsor, LaSalle and Tecumseh, Ontario, in the summer of 1956.

The first telephone users in Canada to make use of the new system, these Windsor and area customers have been receiving directly-dialed long distance calls from several Michigan, U.S.A., centres for several months through Detroit's crossbar mechanism.

An important prerequisite to the completion of the plan . . . is the adoption of a uniform numbering system under which the 55,000,000 telephones in the two countries will all have numbers with two letters and five digits.

In addition, Canada and the U.S. have been divided into about 100 numbering areas, each with a three-digit code. When the plan, called "direct customer dialing," is in full effect, callers dialing from one numbering area to the other will dial 10 digits . . . three for the numbering area and two for the two letters and the five figures of the telephone number.

*(Continued on page 25)*



△ THESE floor-to-ceiling racks called "sender link frames," are part of the giant electronic brain which makes Toronto a key centre in the long-distance dialing network.

LOCATED in the three top floors of Bell's Adelaide Building, the Toronto crossbar installation routes and connects calls between 90 Canadian and U.S. long distance centres.





# SNOW SCIENCE

By Frank C. Wood



IT MAY come as a surprise to residents of the District of Parry Sound to learn that their area is considered one of Ontario's chief "snow-belts."

Surveys conducted by Ontario Hydro's Generation Department in the past two decades or more have yielded the information that the Parry Sound area, on frequent occasions, has some 10 per cent more snow than the rest of the province.

Snow cover surveys were initiated by the Commission in 1931 to obtain advance information pertaining to river levels and flow. The data compiled, when correlated with other climatic conditions, helps in estimating spring operating conditions at existing generating stations.

## Snow Courses

The expansion of this snow cover survey has been gradual but steady since the first "snow course" was established 24 years ago. By 1936, observations were being made at 24 locations in the province. Today, regular measurements are being made of accumulated snow depth and water content at 64 snow courses throughout Ontario. Hydro maintains 51 of these courses, while 13 are in charge of representatives of various government agencies.

The Generation Department, which is responsible for organizing and appraising the surveys, establishes the snow courses, where practicable, within reasonable distance of Hydro generating stations.

A comprehensive survey is obtained by locating the snow courses right across the province from Manitoba to the border of Quebec. The courses, at elevations ranging from 600 to 1,400 feet, are adjacent to 20 rivers, with the Mattagami, Madawaska and Abitibi Rivers each having six and the Albany River four, while the Ottawa, Wanapitei, Nipigon and English Rivers have three courses apiece. The Ottawa River courses were established in 1955. Additional courses are located adjacent to the Missinaibi, Sturgeon, Montreal, Seguin, Severn, Gull, Kaministiquia,



White, Magpie, Mississagi and Spanish Rivers, as well as adjacent to Long Lake.

### U.S. Surveys

The results of surveys made by U.S. authorities at Winnibigoshish and Winton, in a section of Minnesota forming part of the Lake of the Woods watershed, are conveyed to Ontario Hydro through the Canadian Government.

Most of the men making the surveys are operators or other staff at Hydro generating stations, while 13 are employees of the Ontario Government's Department of Lands and Forests. The courses for these men are usually established within walking distance of local forestry headquarters.

There are also seven privately-employed observers of varying occupations. At Bamaji Lake, near the English River, for instance, a storekeeper makes the survey, while at Pagwa on a tributary of the Albany River, a Department of Transport employee does the work. At Ruel station, on the Mattagami River, the task is entrusted to a telegraph operator.

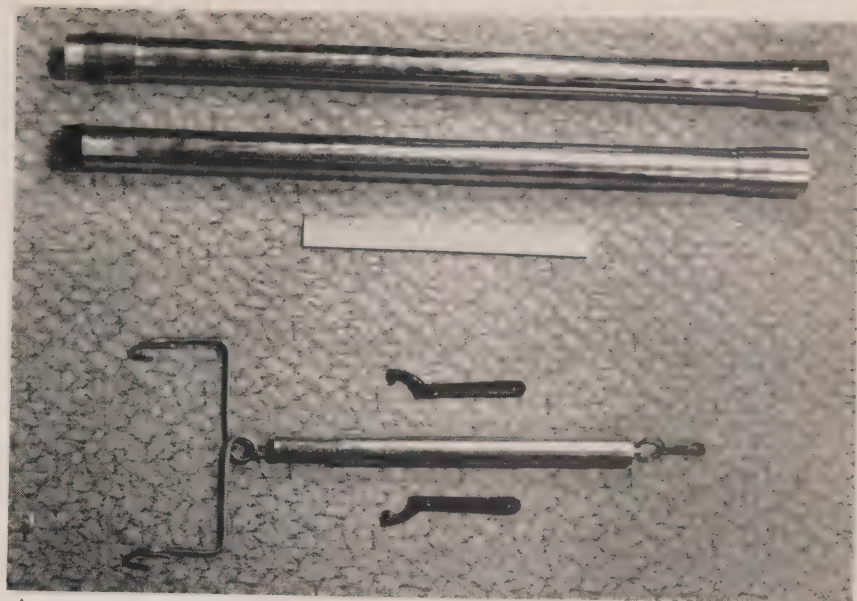
### Special Training

Before undertaking their first surveys, these men were trained by the Generation Department. Three members of this staff also occasionally undertake surveys for special purposes.

Since 1944 an "Eastern Snow Conference" has been held each year, usually in the United States. The Commission sends a representative from the Generating Department and one from the Operations Division to these conferences, as the information obtained from the exchange of ideas and the addresses are considered to be of value, particularly the discussions pertaining to the volumetric prediction of run-off.

A snow course consists of 31 observation points at 100-foot intervals along a 3,000-foot course, which has been selected as representative of the watershed on which it is

*(Continued on page 22)*



△  
THE duraluminum tube or sampler (depicted in two sections above), is inserted perpendicularly into the snow down to the ground surface, the snow depth being indicated by the graduations on the side of the tube. The hooks on the spring balance (lower portion of the photograph), hold the sampler in a horizontal position while the core and tube are weighed.

▽  
CORES of snow are "drilled" by a snow sampler at 100-foot intervals, the tube and snow being weighed on a Chatillon scale. Weight of the snow core in ounces (determined by deducting the weight of the sampler), is equivalent to the water content in inches of depth.



located. These surveys are made once or twice monthly from January 1 until the snow cover has disappeared.

For taking measurements of snow depth, a duraluminum tube, called a snow sampler — usually made in two sections — and a spring balance are used. At one end of the tube is a hardened steel cutter for piercing snow crusts and along its length are a number of slots which are used to observe the length of the core. The inside diameter of the tube, about one and one-half inches, is such that the weight of the snow core in ounces is equivalent to the water content in inches of depth.

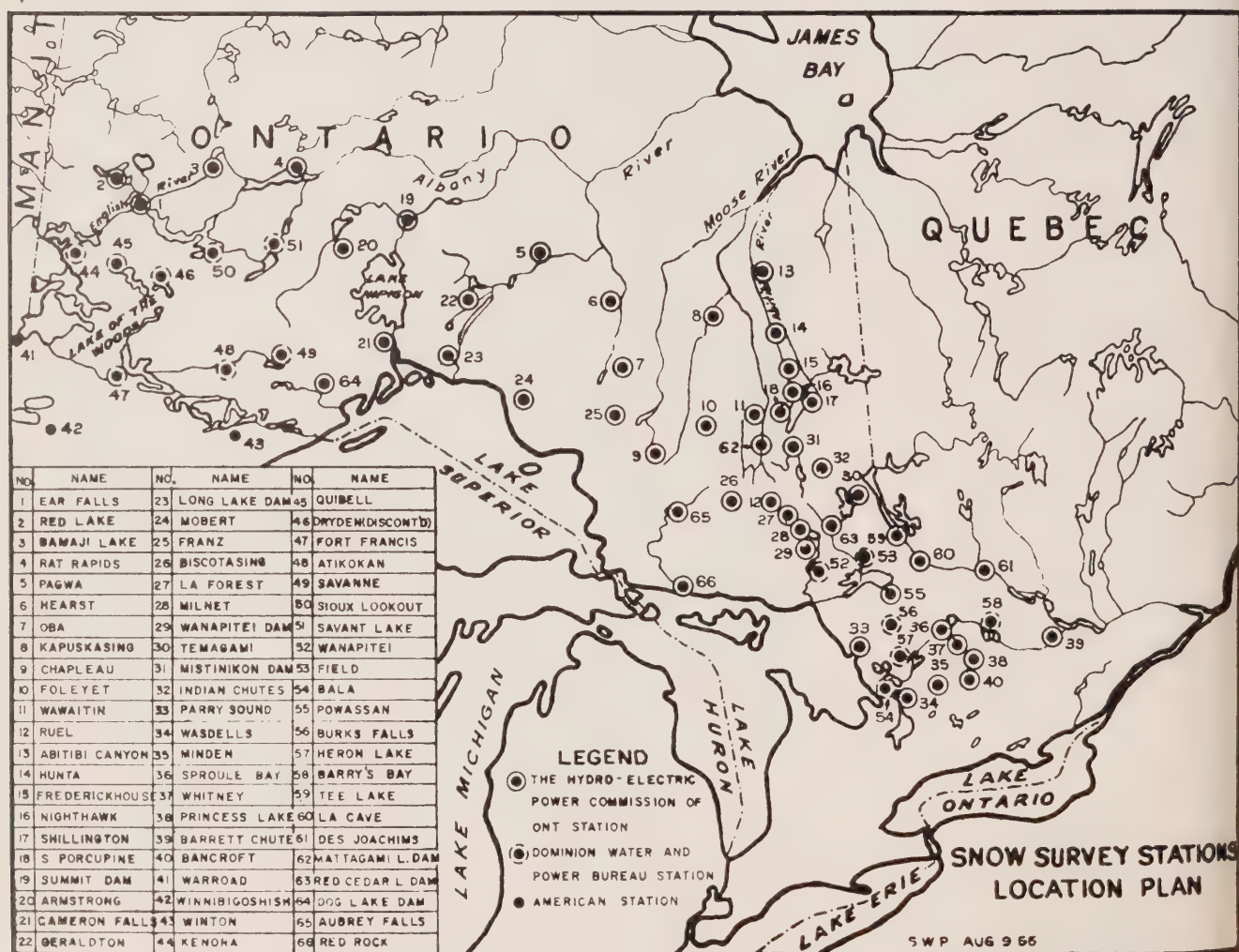
A TOTAL of 64 snow courses are located at various points in Ontario, while two courses are also situated in northern Minnesota.

In making a snow survey, the observer locates the observation points, and inserts the sampler tube perpendicularly into the snow down to the ground surface. Snow depth is observed from the graduations on the tube and the tube is then pushed into the ground to pick up a small earth plug. When the tube is lifted out of the snow, the earth plug is removed, and the tube and snow are weighed. After deducting the weight of the tube, the resulting weight indicates the inches of water content at that point. The average of the 31 observations made at each snow course is considered as representative of snow depth and water content for the course.

While the relationship between snow water content and spring run-

off has not been definitely established, because the period of record for most locations is too short, averages have been computed and are used in conjunction with other observed phenomena — rainfall, sunshine, ground and air temperature, clouds, etc., to estimate spring freshets.

Snow cover surveys represent a relatively new form of scientific observation compared with recordings of other phenomena, such as rainfall, tides and temperatures. Present surveys indicate, however, that heavy concentrations of snow are experienced in different areas from year to year, with the Parry Sound area registering the consistently highest snow blanket.





# ALONG HYDRO LINES



## Salt Deposits Cause Power Faults

Ontario Hydro's line crew of the Brockville Rural Operating Area recently cooperated with the line staff of Brockville P.U.C. in an important "mopping-up" operation.

Salt from a local plant engaged in processing and preparing this commodity for winter highway operations is said to have formed deposits on insulators at an adjacent transformer station. Melting snow caused short circuits and a power cutoff.

Line crews of the Commission and the local utility found it necessary to wash off the insulators with warm water during a temporary power interruption.

## Retires With 44-Year Service Record

Completing 44 years' service with the Public Utilities Commission, of the City of Kingston, Frank Acton, line distribution superintendent, was presented with a car radio recently by staff colleagues to mark his retirement.

## Retired Utility Employee Dies

An employee of Port Arthur Public Utilities Commission for more than 24 years, M. E. Ardell, died recently at Haddonfield, N.J. An operator at one of the Lakehead City's substations, Mr. Ardell served with the Port Arthur utility from 1924 to 1948.



## HONOR ST. CATHARINES EMPLOYEES

Pins for long service to St. Catharines electrical customers were presented at the recent annual dinner for the employees of the St. Catharines Public Utilities Commission. Two men received pins marking 35 years with the commission, and here, Commissioner W. B. Elliott (left) who made the presentations, congratulates Charles Howarth and John Barber. Other pins went to Barney Easton, 20 years; J. "Wandy" McMahon, 15, and John Haldane, 10.

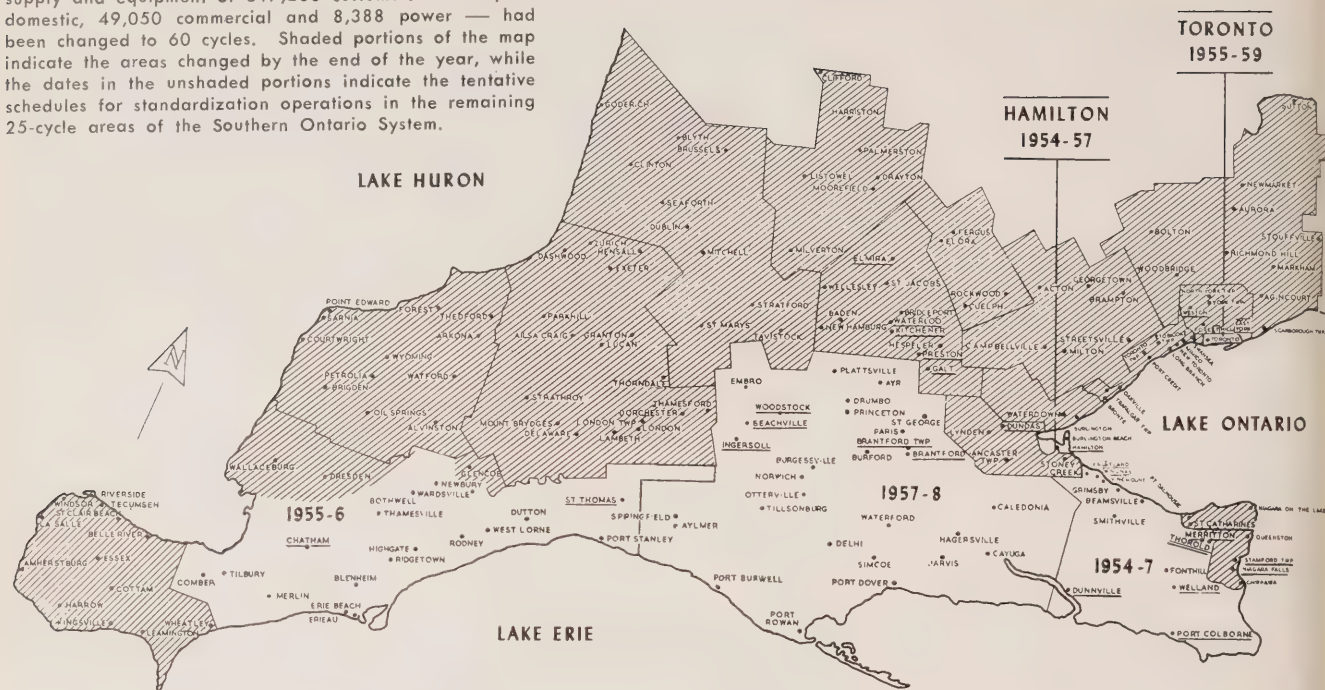
## Voters Approve Purchase

Ratepayers of Brantford Township have endorsed the proposal of the township council to purchase electrical facilities serving certain sections of that municipality from Ontario Hydro. On January 1, 1955, the City of Brantford annexed the major portion of the former Brantford Township voted area. With this new mandate from the electors, Brantford Township Hydro Commission will proceed to purchase all distribution facilities within the balance of the township presently operated by Ontario Hydro.

## Appoint Hanover P.U.C. Superintendent

Associated with St. Catharines P.U.C. for the past six years, Kenneth Baird Jr., has been named Superintendent of Hanover P.U.C. Mr. Baird, whose appointment took effect January 1 this year, was engaged in frequency standardization surveys at St. Catharines. He is a native of Hamilton.

HYDRO'S frequency standardization program made impressive strides last year. By the end of 1955, the electrical supply and equipment of 617,260 customers — 559,822 domestic, 49,050 commercial and 8,388 power — had been changed to 60 cycles. Shaded portions of the map indicate the areas changed by the end of the year, while the dates in the unshaded portions indicate the tentative schedules for standardization operations in the remaining 25-cycle areas of the Southern Ontario System.



## Honor 25-Year Windsor Employees

Four employees of Windsor Utilities Commission were honored recently on completion of 25 years' service. At a dinner honoring 94 long-service employees of the commission, representing a combined total of more than 3,000 years' service, C. E. Hillman, Robert Allan, William Weeks and Albert Stockman were presented with pins and watches. Wesley Armour, Hydro Division Superintendent, who completed 40 years' service in 1955, was presented with a \$100 cheque by J. Clark Keith, retired General Manager.

## Walked 75,000 Miles As Meter Reader

Members of Fort William Hydro-Electric Commission honored Frank H. Kitley, senior meter reader, who retired recently with 35½ years' service to his credit. During his long career, Mr. Kitley walked 75,000 miles in performing his duties, according to a conservative estimate.

## Plan New Regional Building At Belleville

A Belleville firm of architects, Watson and Wiegand, has been retained by Ontario Hydro to prepare working drawings for the new headquarters of its East Central Region. Construction of the new building on a five-acre site on Belleville's eastern outskirts is scheduled to start later this year. The two-storey structure, with basement, which will be of stone and brick construction, will cost an estimated \$500,000.

## Owned Steam-Electric Plant At Millbrook

Dr. H. A. Turner, a widely-known Millbrook, Ontario, medical practitioner, who was the principal owner of a steam-electric plant in that Peterborough district village for many years, died recently in his 88th year. The steam plant was taken over by the municipality and operated until Hydro services were inaugurated. Dr. Turner practised at Millbrook from 1892 until 1937.

## Served 17 Years As Chairman

Beamsville Hydro-Electric Commission has named a new chairman for the first time in 17 years. William F. Rannie, a member of the commission for the past year has been named to this post, succeeding Fred Barraclough, who retired at the end of 1955, after serving on the commission for 18 years, including 17 unbroken years as chairman.

## Utility Building Advocate Retires

Forthright advocate of the new utility headquarters, now under construction, L. F. Snider retired recently after seven years' service as a member of Brantford Public Utilities Commission. He was honored by commission colleagues with the presentation of an address and a framed sketch of Brantford's new utility headquarters. Brantford City Council has named Norman Boyd to complete Mr. Snider's unexpired term.



## VIEW CHANGEOVER OPERATIONS

**R**EPRESENTATIVES of 15 western Ontario municipalities have a better conception of Hydro's changeover procedures following an "on-the-spot" preview of recent operations at Chatham.

Actively associated with the electrical systems of communities where standardization is scheduled within the next few months, the civic and utility officials represented: Blenheim, Ridgetown, Thamesville, Muirkirk, Highgate, Morpeth, Tilbury, Bothwell, Comber, Merlin, Tupperville, Paincourt, Newbury, Wardsville and Mosa Township.

In all, nearly 100 officials from these municipalities, where standardization will take place by August of this year, attended the three Chatham tours. The itinerary included a visit to the main standardization base for the Kent County area in Chatham, where the functions of the warehouses, workshops, offices and the facilities for service were described.

At a switching site, the officials were told that power is usually off

for only a few minutes between the cutover from 25 to 60 cycles.

The parties also toured the area being standardized and saw the streets thronged with the red Hydro trucks. At the changeover depot in Chatham, the numerous types of clocks and fans available were inspected and the arrangements for exchanging these appliances explained.

At the Rankin Hotel, slides were shown of the F.S.D. headquarters at the A. W. Manby Service Centre, Islington, near Toronto, and numerous questions were answered concerning the program.

R. S. Reynolds, General Manager, Chatham P.U.C., spoke briefly during the third tour and assured the officials that their problems in connection with changeover would not be serious.

"If the Chatham Commission can help you when standardization comes to your municipalities—if you are short of equipment, or want help in any way, we shall be glad to supply it" he said. ■

## EXPAND NIPIGON PLANTS

Pacing rapid industrial expansion and increasing power demands in northwestern Ontario, the Commission has announced approval of additional units at its Alexander and Cameron Falls Generating Stations on the Nipigon River.

This step will increase the resources of the Northwestern Division by 31,500 kilowatts in the summer of 1958. So far this year, demands have been approximately 25 per cent higher than during the same period of 1955.

The Commission already has plants under construction at Manitou Falls on the English River and Whitedog Falls on the Winnipeg River to meet the anticipated load

growth in the area. However, the expansion of this section of the province has been so rapid that it has been necessary to step up the schedule for the Whitedog Falls plant by one year, as well as authorizing the immediate installation of the new units at Alexander and Cameron Falls in order to meet the power demands presently indicated for 1958.

The new plant additions will increase the dependable peak capacity of the Alexander plant by 13,500 kilowatts and that of the Cameron Falls plant by 18,000 kilowatts. The total estimated cost of the additions to these plants is approximately \$8,000,000. ■

## ELECTRONIC BRAIN

*(Continued from page 19)*

Before customer toll dialing can be introduced, however, other new equipment must be placed in service. Called automatic message accounting equipment, it will perform other duties now done by operators. It will note the number of the calling telephone, the city and number called, the date, time of day and duration of the call. If the line is busy or the telephone is not answered, it will cancel its own instructions.

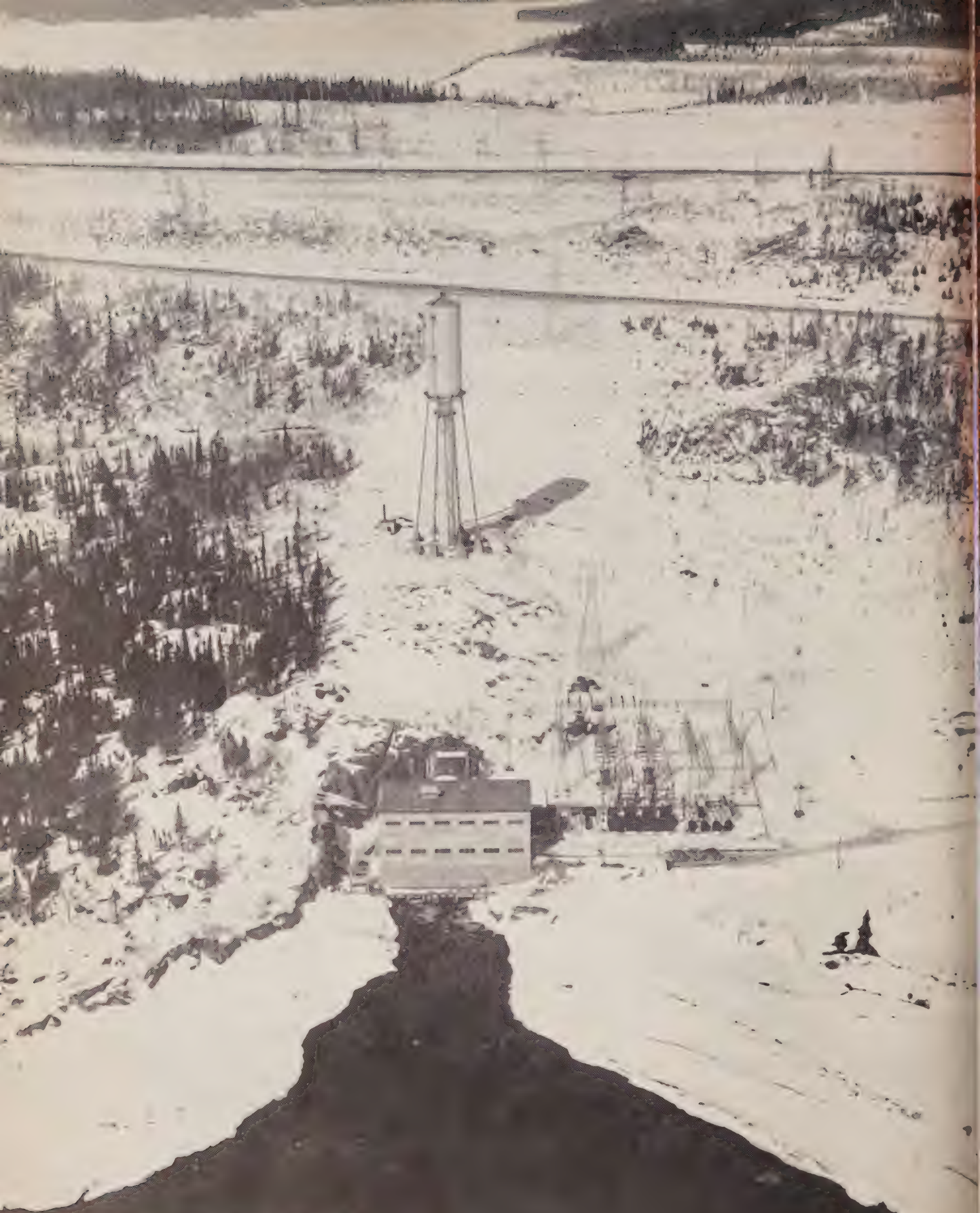
The mechanization of long distance calling will not reduce the ranks of operators, but will free them for other telephone duties, just as the introduction of dial service for local calling has made operators available for the rapidly-expanding use of long distance. In fact, had it not been for the development of direct dialing equipment, there would not have been enough girls available to handle all the calls.

Selection of exchange names to fit in with the plan is an important phase of the project. As the first two letters and the digit following them, such as J47 in Hamilton for example, identify the exchange, this combination cannot be duplicated anywhere in the same numbering area. The names must be easily understood and pronounced by people in all parts of the two countries . . . in Trois Rivières as in Dallas . . . and names which have two possible spellings are not suitable for use.

Thus, through the science of electronics and engineering ingenuity, Canada and the United States are being turned into one vast telephone exchange. ■

### Retires After 47 Years' Service

Retiring recently after completing 47 years' service with the Ottawa Hydro-Electric Commission, Charles Belleau was presented with a wallet and cash by his commission associates.



AGUASABON PANORAMA



ONTARIO HYDRO

# News

APRIL, 1956



◁ Golden Jubilee Cake



# ONTARIO HYDRO

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POWER COMMISSION OF ONTARIO  
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## CONFIDENCE BUT NOT COMPLACENCY

INAUGURATING, in effect, the celebration of Hydro's Golden Jubilee, this year's O.M.E.A.-A.M.E.U. joint annual convention (reports of which are found on the succeeding pages of this issue) provided refreshing evidence that Hydro has attained the half-century mark in a strong and healthy position.

The Commission's present status as one of the largest public utilities in the world, with total assets of more than \$1.8 billion and total resources of 4,530,000 kilowatts, amply justifies the fierce and profound faith of those who fought so valiantly to establish a publicly-owned electrical system in Ontario. In fact, it seems not unreasonable to assume that the present scope of Hydro operations in Ontario today far exceeds even the most optimistic hopes of those early protagonists.

While this year's convention afforded many opportunities for reviewing the almost incredible achievements of the past 50 years, it was made abundantly clear that the Commission and its associated municipalities throughout the province will be confronted with numerous challenges and many complex problems in the next half-century.

Alluding to the imminence of "the age of nucleonics and automation," Chairman Dr. Richard L. Hearn told delegates that Ontario Hydro's total resources may reach approximately 23.6 million kilowatts in the next 25 years to meet anticipated demands. Sustaining Dr. Hearn's forecast, Hydro's General Manager, A. W. Manby, in dealing with power demands during his convention address, made the cogent observation that the energy requirements of municipal Hydro utilities alone increased by approximately 10 percent in 1955.

Re-emphasizing the Hydro Chairman's call for "alertness led by forward thinking," retiring O.M.E.A. President A. A. Kennedy suggested that municipal systems should be making immediate plans for the type of distribution systems, which will be necessary to meet the demands of a decade and more hence. In the same vein, another speaker, Harry Hyde, Assistant Chief Engineer of the Toronto Hydro-Electric System (whose address is reprinted in full elsewhere in this issue), dealt at length with the urgency and possible methods of making long-term "provisions necessary to cope with the twofold, threefold and fivefold increases (in demand) in the next 25 years."

These warnings and suggestions were well-timed and will, no doubt, have a profound and salutary effect upon the deliberations and decisions of the hundreds of men and women identified with the Hydro systems of the province in the imperative realization that this Golden Jubilee Year is a time for fully-merited confidence but not complacency.

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## COVER SHOTS

IN HARMONY with the Hydro Golden Jubilee spirit so evident at this year's joint annual O.M.E.A.-A.M.E.U. convention, this month's front cover shows the retiring O.M.E.A. and A.M.E.U. Presidents, A. A. Kennedy (left) and H. A. Howard respectively, performing the traditional cutting of the anniversary cake. This ceremony preceded the toast to Ontario Hydro proposed by George F. Hutcheson, Huntsville, to which Chairman Dr. Richard L. Hearn replied. (For further details, see "Jubilee Tribute" in this issue.)

Maintaining the anniversary theme are the gold medallions on the back cover, which symbolize the Hydro Golden Jubilee celebrations.



# "MEMORABLE YEAR"

**Hydro Chairman Announces \$3,855,000 Rebate to Cost-Contract**

**Municipalities During Annual Address to O.M.E.A.-A.M.E.U. Delegates**

**A** LONG and searching look into the future was taken by Dr. Richard L. Hearn, Chairman of Ontario Hydro, in the course of his address to O.M.E.A. - A.M.E.U. delegates at their 47th annual convention this year.

The whole future of power generation in Ontario, predicted Dr. Hearn, may well be decided within the course of the next 10 years. "The age of nucleonics and automation is almost upon us," he told delegates, "and our admittance to this new era will come only through courage, a keen sense of alertness led by forward thinking, and an unswerving faith in the future of this province."

Speaking of the more immediate future, Dr. Hearn assured his audience that, although individual municipalities will, undoubtedly, find some adjustments in retail rates necessary to meet local conditions, no increase in the cost of power to the municipalities is envisaged for 1956. Preliminary figures, he announced, indicate that revenues from interim rates during 1955 were sufficiently in excess of costs to permit rebates totalling \$3,855,000 to the majority of cost-contract municipalities. The number of thirteenth bills to municipalities for 1955 is comparatively small this year.

Special interest in Dr. Hearn's address was displayed by delegates, marking as it did the completion of the speaker's first year as Chairman of Ontario Hydro. For himself, Dr. Hearn told his audience, the past year was a memorable one. For

Ontario Hydro it was no less significant: primary power demands reached a record level, reflecting a rate of growth of some 14 percent over the 12-month period. The actual kilowatt increase in 1955 was about two and a half times the increase experienced in each of the years 1953 and 1954.

That Ontario Hydro was able to meet this heightened demand for power and still maintain a margin of reserve was due, in no small measure, said Dr. Hearn, to the additional generation contributed by the stations at Niagara and Pine Portage — and to the return to service of two units at Hydro's Richard L. Hearn steam station in Toronto.

## **Load Forecasts Revised**

A revision of load growth estimates for future years has been necessitated by the effect of Ontario's thriving economy on the demand for power, Dr. Hearn said.

"With all indications pointing to a continued upswing in the industrial and economic growth of the province, it can be assumed that load growth for the next two or three years will be at least equal to the long-term rate of better than six percent a year and could easily equal the annual rate of growth of 8.2 percent experienced over the last five years," he added.

Ontario Hydro now realizes that additional capacity will be required to provide a reasonable reserve in 1957 and 1958 to take care of such contingencies as low water conditions, breakdown of equipment or abnormal load growth. With this in



**CHAIRMAN DR. RICHARD L. HEARN**  
Ontario Hydro

mind, the Commission has decided to go ahead immediately with the installation of two, additional 75,000-kilowatt units at the Sir Adam Beck - Niagara Generating Station No. 2 and one 200,000-kilowatt unit at the Richard L. Hearn steam station in Toronto—the largest steam-turbine generating unit yet to be installed in Canada. Early this year the Commission further decided to

*(Continued on page 2)*

proceed with the installation of two more units at the new Niagara development to complete the ultimate plan for 16 units in the main powerhouse.

Rapid expansion of the north-western section of the province has also been a factor influencing the Commission to accelerate its planned power program. In addition to construction of the Manitou Falls Generating Station, it became necessary to step up the schedule of the 54,000-kilowatt plant at White-dog Falls by one year. The most recent action taken by the Commission to offset expected future demands was the authorization in February of this year of the installation of a new unit at each of Hydro's Alexander and Cameron Falls stations. This will increase the resources of the Northwestern Division by 31,500 kilowatts and will meet power demands presently indicated for 1958.

### Nuclear Energy Program

The announcement in March, 1955, of Ontario Hydro's participation, with Atomic Energy of Canada Limited and the Canadian General Electric Company, in the construction of an experimental nuclear-electric station on the Ottawa River was described by Dr. Hearn as "one of the most significant decisions of the year."

The immediate importance of nuclear power research and development has been made clear by studies undertaken by Ontario Hydro to plot the course of future load growth and to determine the sources of new power generation. Dr. Hearn pointed out that it has taken almost 50 years to develop in Ontario a dependable peak capacity of 3.2 million kilowatts from hydro-electric resources and some 637,000 kilowatts from conventional fuel-electric stations, not taking into account purchases from other sources. The diminishing hydraulic sites of the province indicate that, within a comparatively short period of time, Ontario Hydro will start

to change over from a predominantly hydro-electric utility to one in which fuel-electric power will play an increasingly important part. Another new trend will be observed from about 1965, when it is assumed that nuclear fuel - electric stations will be economical for base load operations.

In order to meet demands of 21.9 million kilowatts within the next 25 years, Ontario Hydro's total resources may reach approximately 23.6 million kilowatts by that time. This amount will be made up of 5.5 million kilowatts from hydro-electric generating stations, 10.6 million from conventional fuel-electric and almost 7.5 million kilowatts from nuclear-electric generating sources.

Dr. Hearn's remarks were emphasized by two large graphs, prominently displayed to show results of the Commission's studies on load growth. One graph illustrated the higher of two estimates of load growth and the resources necessary to meet the demand; the other plotted the growth of primary power requirements from 1922, with projections from 1955 at both the higher and lower estimates of the two studies. From 1960 the load was plotted at annual rates of growth of three, four and five per cent.

### Frequency Standardization

Reporting on progress of the second half of Ontario Hydro's frequency standardization program over the past year, Dr. Hearn said that by December, 1955, almost 70 percent of the entire load was converted at a total cost to the Commission for work done of less than \$224 million. Present calculations point to June, 1959, as the date for completion of the changeover program, with total expenditures for the overall program remaining within the revised calculation of two and one-quarter times the originally estimated cost.

"I feel," said the Chairman, "that this is something of an achievement



in view of the continued high price of labor and materials and the saturation level of frequency-sensitive items we have encountered."

Dr. Hearn drew attention to two new policies adopted by the Commission during the past year, both of direct interest to municipal electrical utilities. The first was another step in the pooling of costs by including 115,000-volt transmission. This procedure was necessitated by the integration of the Southern Ontario System, the location of fuel-electric plants and the interconnections with neighboring utilities. The second step was the





JOHN FISHER, CANADIAN RADIO COMMENTATOR, ADDRESSED DELEGATES DURING THE JOINT LUNCHEON

revision of the resale rate structure within the municipalities after a long and intensive study of the whole problem. This study was made in collaboration with other utilities on this continent and after careful checking of the new consumption habits of customers. In this connection, Dr. Hearn expressed his appreciation of the work done by members of the Rates Committee of the A.M.E.U., which worked closely with the Commission's Rate Study Engineer, A. W. Murdock.

#### Tremendous Support

In his closing remarks the Chairman paid tribute to the "tremen-

dous support" and cooperation received during his first year of office from fellow-Commissioners, Hon. William K. Warrender, W. Ross Strike and A. A. Kennedy.

"We were all pleased," he added, "to hear last year of the appointment to the Commission of Colonel Kennedy. I think it signifies well-merited recognition of the role the O.M.E.A. plays in guiding the policy of Hydro in Ontario."

High praise was also given to the management and staff of Ontario Hydro throughout the province: "I sometimes wonder," reflected Dr.

Hearn, "if we fully realize the tremendous job these people are carrying out to maintain a very high degree of efficiency in an organization with total assets approaching two billion dollars."

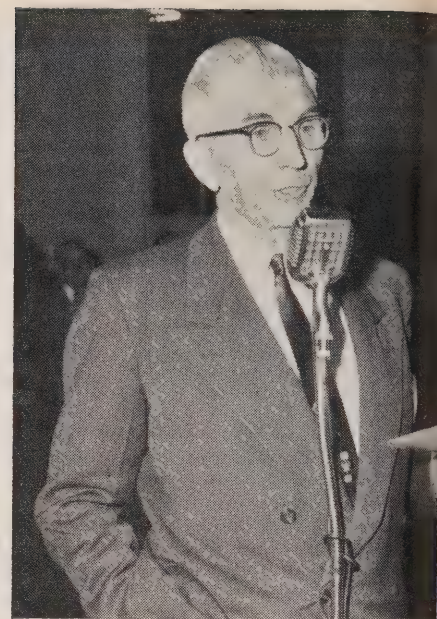
"In conclusion," said Dr. Hearn. "I know you are all aware that this year we shall celebrate the Golden Jubilee of Hydro in Ontario. The Hydro enterprise has been built on a solid foundation by men such as yourselves and your predecessors. I ask only that we and those who follow us endeavour to carry on this proud tradition of the past."

—by J. J. Kirkwood.



# RESOLUTIONS DEBATE

**O.M.E.A. Delegates Discuss Important  
Topics During Annual Convention in Toronto**



**J. T. BARNES**  
Sarnia

SIXTEEN resolutions, many of them with suggested changes and amendments by the Resolutions Committee, were submitted to the delegates of the O.M.E.A. at the recent annual convention of the Association at the Royal York Hotel in Toronto. A. A. Kennedy, President of the O.M.E.A. presided, but called upon Bert Merson, Chairman of the committee, to read the resolutions and, where necessary, to clarify their purport.

Principal discussion focussed on a resolution presented by District No. 5: "That this Association request the H.E.P.C. to defer any action with respect to the pooling of transmission costs until the matter is discussed with the O.M.E.A. at the next annual meeting." The Resolutions Committee expressed opposition to this resolution on the grounds that the Board of Directors of the O.M.E.A. had approved of the pooling of 115 kv. transmission costs.

Speaking on behalf of the resolution, W. B. Elliott, St. Catharines, said District No. 5 had asked that action, with respect to pooling transmission costs, be deferred because the matter had not been properly

brought before the O.M.E.A. for discussion.

"We concur in general," he said "with the establishment of an equalized wholesale rate, but we hold that the rate should not be put into effect before our approval is given. This business has been under investigation since 1950. The H.E.P.C. should come forward with some proposal upon which we can vote. Very likely we would agree with its proposal, but we must be accorded the privilege of debate. Otherwise, the reason for our existence is gone."

Mr. Merson, in reply, explained that the Board of Directors of the O.M.E.A. had thoroughly discussed the matter with Ontario Hydro and had taken the action, which it considered to be in the best interests of the municipalities. He said that this action of the Board had been unchallenged by the municipal Hydro commissions, which were free to call special meetings if they were dissatisfied with the procedure. No such meetings had been called.

"District No. 5 did call a special meeting," interjected Thomas

Barnes, Niagara Falls.

"When?" asked Mr. Merson.

"In December."

"Pretty late," smiled Mr. Merson, who intimated that the Board had already given its approval by that time.

Mr. Elliott insisted that the Board of Directors had made a serious mistake in not making the question of wholesale rates a subject for general discussion.

Mr. Merson maintained that the action taken by the Board of Directors as the accredited representative of the municipalities was completely in accord with the principles of democratic government. "Anyway," he added, "what has been done is rather to agree to a method of cost accounting, which is a responsibility of Ontario Hydro."

This explanation did not completely satisfy Mr. Elliott and he moved the adoption of the resolution, winning a second in Mr. Barnes, who had spoken along somewhat similar lines. Put to the vote, the resolution was rejected and the stand taken by the Board of Direc-





DR. R. A. PATTERSON  
Kemptville



BERT. MERSON  
Toronto

tors and the Resolutions Committee approved.

In spite of this defeat, however, the position taken by District No. 5 appeared to have been, to a large extent, salvaged by the Committee's approval of a supplementary resolution, with the change of only one word.

The resolution originally read: "that the H.E.P.C., following consideration of the equalized wholesale rate, as requested by the O.M.E.A. on Tuesday, February 28, 1950, discuss this matter with the O.M.E.A. before taking any action on it and that a copy of this resolution be forwarded to the O.M.E.A. and to the H.E.P.C." The tailoring effected by the Committee was to substitute the word "further" for the word "any," implying that what is done cannot be undone, but that what is still in prospect can be discussed. Mr. Barnes was alert to second this resolution as amended and it was carried without further debate.

#### Methods Of Representation

Another resolution from District No. 5 requested the O.M.E.A. "to

appoint a special committee comprised of the O.M.E.A. president and the district presidents and one other representative of each district to review the methods of representation and voting in the O.M.E.A. with a view to revising the constitution to provide greater equity of representation, this to be presented at the convention of 1957 or earlier."

The committee recommended the adoption of this resolution, with the deletion of the words "and one other representative of each district." With this change, the resolution carried unanimously, with C. J. Halliday, Chesley, seconding the motion of the chair.

A resolution from District No. 1, with some additions by the committee, broadening its scope, was also passed unanimously. As amended it read: "That this Association draw to the attention of the O.M.E.A. Executive the danger of overfusing of branch circuits and requests that they, in turn, forward to the H.E.P.C. a request that their warning against this practice be continued in their advertising program and

that a similar request be sent to the Electric Service League of Ontario." G. F. Hutcheson, Huntsville, seconded the chairman's motion for acceptance.

District No. 3, presented two resolutions. One was carried and the other rejected.

The adopted resolution read: "That this meeting of District No. 3 reaffirm our previous resolution and the resolution of District No. 5 dealing with the question of rebates to municipalities of power charges to certain of our utilities"

"It is just a question of keeping this matter alive," commented Mr. Merson. M. J. Elliott, Bowmanville, seconded his motion of adoption.

The second resolution read: "Whereas it is felt that the commissions do not receive sufficient copies of items to be dealt with at all meetings of the Executive Committee of the O.M.E.A. in time to allow for a proper discussion and action by local commissions, therefore be it resolved that the O.M.E.A. be

*(Continued on page 6)*





DURING consideration of the recommendations of the Resolutions Committee, members of the O.M.E.A. Board of Directors, left to right: Gordon H. Fuller, Windsor; J. S. Killingsworth, London; C. J. Halliday, Chesley; G. F. Hutcheson, Huntsville; D. P. Cliff, Dundas, Secretary-Treasurer; Committee Chairman Bert. Merson, Toronto; Harvey Hawke, Galt; President A. A. Kennedy, Owen Sound; C. R. Buss, Thorold; W. B. Elliott, St. Catharines; G. H. Glover, St. Marys; S. G. Thomson, Chatham; E. V. Dyke, Smiths Falls; C. H. Moors, Fort William; Dr. V. S. Wilson, Etobicoke Township, and J. G. Baldwin, Lindsay, paused while photograph was taken.

requested to prepare and distribute agenda for all meetings to all commissions well in advance of such meetings."

This request would place, Mr. Merson stated, an intolerable burden upon the Secretary of the O.M.E.A., who would have to make out an agenda for over 300 municipal commissions. This was recognized at once by the framers of the resolution, who concurred in its unanimous rejection.

District No. 6, which has shown great interest in preparing for the celebrations, which will mark Hydro's Golden Jubilee, suggested, in a resolution, that the O.M.E.A. should appoint a committee to set aside one week in 1956 for a suitable province-wide celebration and that every Hydro municipal office be appropriately decorated for the designated week.

Mr. Merson explained that it would be impracticable to set aside one particular week as many of the municipalities already have decided upon dates for their own celebrations. He, therefore, asked for the adoption of the following substituting resolution: "That every effort be made to publicize the 50th anniversary of Hydro and that the details be left to the present joint Golden Jubilee Committee consisting of representatives of the O.M.E.A.,

A.M.E.U. and H.E.P.C." This amendment was seconded by Thomas Barnes, Niagara Falls, and carried unanimously.

#### Urge Industrial Consultant

From District No. 7 came a resolution reading that: "Whereas the consideration of adequate compensation for the employees of municipal utilities has become, in recent years, not only more involved but more concerned with wage rates and contracts in other municipalities, as well as in Ontario Hydro, therefore be it resolved that the appointment of an industrial consultant as proposed by the A.M.E.U. Employee Relations Committee is desirable and that this resolution be submitted to the O.M.E.A. at the annual convention in Toronto in February, 1956, for their consideration and endorsement."

Mr. Merson stated that the committee did not approve of this resolution. The expenses involved in the employment of a special consultant and the geographical distribution of the different municipalities and the varying wage norms made it defin-

itely impracticable to put it into effect. This position was supported by a motion of L. L. Coulter, Ottawa, seconded by A. T. Smith, North Bay. With the concurrence of the delegates, the resolution was set aside.

The following resolutions were approved by the committee, moved by the chair, and carried with little discussion.

From the O.M.E.A. Board of Directors: "Be it resolved that we petition the Provincial Government to provide in the Public Utilities Act, the following: 'Every person who, without the consent of the local Hydro commission, nails or otherwise attaches anything, or causes anything to be nailed or otherwise attached to or upon any property of the local commission, shall be guilty of an offence punishable under the law.'"

From Toronto Township Hydro-Electric Commission: "That the O.M.E.A. appoint a committee to study and report to the Directors on standardization of qualifications and job certification and request the



cooperation of the A.M.E.U. in this work."

From the Resolutions Committee: "Whereas, the tours of Ontario Hydro Head Office, Research Laboratory, and other undertakings recently made available to groups of O.M.E.A. members have proven to be of great interest and benefit; be it resolved that this Association commend the H.E.P.C. for making such tours possible, and especially thank our President for his initiative in that connection; and be it further resolved that we request the incoming Executive to do all possible to publicize the tours and ensure good attendance."

### Favor 1,500-Hour Lamps

From the A.M.E.U. Merchandising Committee, through the O.M.E.A. Secretary: "Whereas Hydro 1500-Hour Lamps were made available by The Hydro-Electric Power Commission of Ontario at the request of the Ontario Municipal Electric Association; and whereas Hydro lamps have set the standard for long life in the lamp industry; and whereas a report of the Research Division of The Hydro-Electric Power Commission of Ontario dated August 28, 1953, states 'that over thirty years ago a 1500-hour lamp was designed for Hydro lamps as most suitable for conditions in Ontario and that, under present conditions, the 1500-hour life for incandescent lamps is still to be preferred; and whereas the majority of Hydro municipalities recently indicated, in a survey, their desire to continue to be able to obtain Hydro lamps in order that these may be used for street lighting and for resale to their customers, even if it is necessary to increase the price of these lamps; and whereas there is a trend among manufacturers to make available only 750-hour lamps; and whereas the Hydro Shops in the various municipal Hydro systems pledge their continuing support; therefore be it resolved that the Executive Committee of the Association of Municipal Electrical Utilities of Ontario, on the advice of the Merchandising Committee, in

session on April 18th, 1955, recommend to the Board of Directors of the Ontario Municipal Electric Association that The Hydro-Electric Power Commission of Ontario be petitioned to continue to make available Hydro Long-Life lamps and Long-Life white lamps and that active promotional assistance be provided."

From the Resolutions Committee: "Whereas May 14 marks the 50th Anniversary of the passing of legislation, which resulted in the present Hydro-Electric Power Commission of Ontario; and whereas the municipal organizational movement for publicly-owned generation and distribution of power in Ontario took place in the Kitchener area; therefore be it resolved that the Ontario Municipal Electric Association sponsor a fitting celebration of the occasion in Kitchener, Ontario, on the anniversary date, and in any other districts at such dates as may be approved."

Three resolutions of appreciation for services rendered received unanimous endorsement: The resolutions read as follows: "Be it resolved that this Association go on record as expressing appreciation to James A. Blay, Director of Information, Ontario Hydro and his competent staff, and to W. R. Mathieson, Secretary of the Association of Municipal Electrical Utilities (of Ontario), for their invaluable assistance in the preparation for and conducting of this convention."

"That we tender our thanks to the Editor and staff of *Hydro News* for their untiring efforts in recording the proceedings of not only this convention, but the district meetings as well."

"That this Association go on record as expressing our appreciation of the help and cooperation of the Royal York Hotel and the other Toronto hotels, which assisted in accommodating our delegates; the press and entertainment committee, which have added so greatly to the success of our convention."

—by H. M. Blake.

## CONVENTION CARICATURES



L. G. KING  
Massey



C. E. SHERA  
Wingham



ALBERT MANY  
Welland

# A NEW MOTTO

**"B**Y LOOKING back at the past, we can prepare better for the future."

This was the "apology" of W. Ross Strike, Q.C., Vice-Chairman, Ontario Hydro, "for looking over my shoulder at what has been achieved during the last 50 years by this great organization."

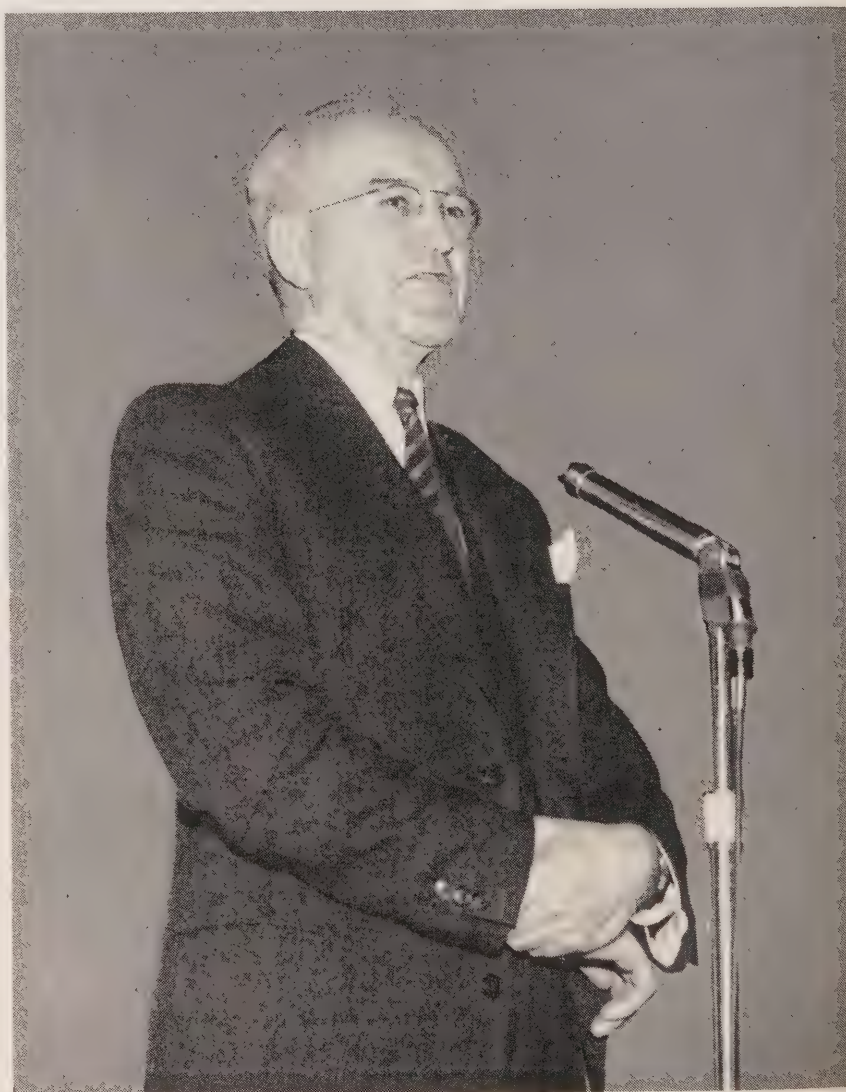
Always prepared to take up the cudgels where "Hydro" is concerned, and liking nothing better than comments or suggestions that give him opportunity to emphasize its importance, Mr. Strike took issue with a recent statement by a university professor about Canadian institutions.

The professor was reported to have stated, in effect, that Canada, lying in the shadow of the great colossus to the south, has yet shown no signs of creating any distinctive institution of its own or of developing any kind of culture that might be regarded as indigenous.

"Ontario Hydro is a distinctly Canadian entity. It is wholly and completely indigenous to this province. It stands pre-eminent in the world as a publicly-owned utility. In its strength, ability and resilience it typifies the character of the people of Ontario. Mail comes in to us from all parts of the world, seeking information as to how we function and perform. Surely that is a mark of the distinctive position we hold," Mr. Strike declared.

The sharing of the gifts of Nature with others was, Mr. Strike recalled, a new conception when Ontario Hydro was formed. The growth of "Hydro," in the face of formidable opposition, had been nourished by people in all walks of life, who had been prodigal of the assistance they had given.

**W. Ross Strike eulogizes Hydro's pre-eminent role as a publicly-owned utility**



W. ROSS STRIKE, Vice-Chairman, Ontario Hydro



"I am calling this little address of mine 'Diamonds in the Backyard,'" announced Mr. Strike, and he intimated that it was about time that people looked around and discovered how precious they are.

These "diamonds," he explained, are the great Hydro family — Ontario Hydro and the municipal commissions and utilities that distribute power to over a million electrical customers.

The pioneers of this great enterprise worked long and hard for an organization that would operate, not for the advantage of a few but for all, he reminded his audience. Many of them were businessmen. They gave not only their time but their money, with a prodigality that often affected their personal fortunes. Somehow or other, these men derived a great satisfaction in the performance of duties, which were of benefit to the people of the province. It was a contagious spirit and it had spread through the whole Hydro fabric.

"The impelling force was not high wages," Mr. Strike emphasized, "but an immense satisfaction that made all work worthwhile. As we look around us, the conviction grows that the principles of the founders of Hydro have been nurtured and maintained right through to this Jubilee year."

### Obvious Duty

During the last five or six years, said the speaker, the population of the province has increased tremendously and hundreds of thousands of people know practically nothing or, at least, very little about the size and importance of the Hydro organization or how it has grown to its present stature. It is, therefore, an obvious duty to inform the public about it and to acquaint them with the ideals for which it stands.

Municipal Hydro commissions and utilities, Mr. Strike continued, throughout a long period of growth, have been strengthened through the attraction to themselves of outstanding businessmen of a high calibre

of honesty and integrity. While there might have been some criticism of honest judgment, the whole Hydro enterprise has been remarkably free from scandal of any kind, he continued.

This honesty of purpose, the speaker stressed, is the guiding light for the future. Unless it is present in the next half century, as it has been in the past 50 years, then all the great works, which the Commission and the Hydro municipalities will be called upon to undertake, will be of little value, because the confidence of the people will have disappeared.

"We must always remember," said Mr. Strike, "that, as our motto tells us, 'The Gifts of Nature Are for the People,' we must distribute them in an efficient and cooperative manner so that all may enjoy them on as equitable a basis as possible."

### Adequate Planning

As the demand for power increases, heavy financing will have to be carried out annually for many years to come, to ensure the best results. The administration and operation of all Hydro systems must be maintained at the highest level of efficiency and considerable new construction will be required. The customers will have to be given the best service possible, involving adequate planning for the future.

"The growth and expansion of this great enterprise during the past 50 years," Mr. Strike observed, "has been due to the cooperation of the Government of Ontario, Ontario Hydro and the local commissions. This cooperation must be retained. If we are to function successfully in the future, employees must be treated and compensated fairly and encouraged to feel that they are part of the organization.

"If we live up to the ideals that have actuated us in the past," concluded the speaker, "there should be no fears for the future. The motto I suggest for the jubilee year is: 'We share. We cooperate. We serve.'" — *By H. M. Blake.*

## AMONG THE SPEAKERS



J. E. TECKOE Jr.  
Windsor



RAY PFAFF  
St. Catharines



G. R. DAVIS  
Kingston





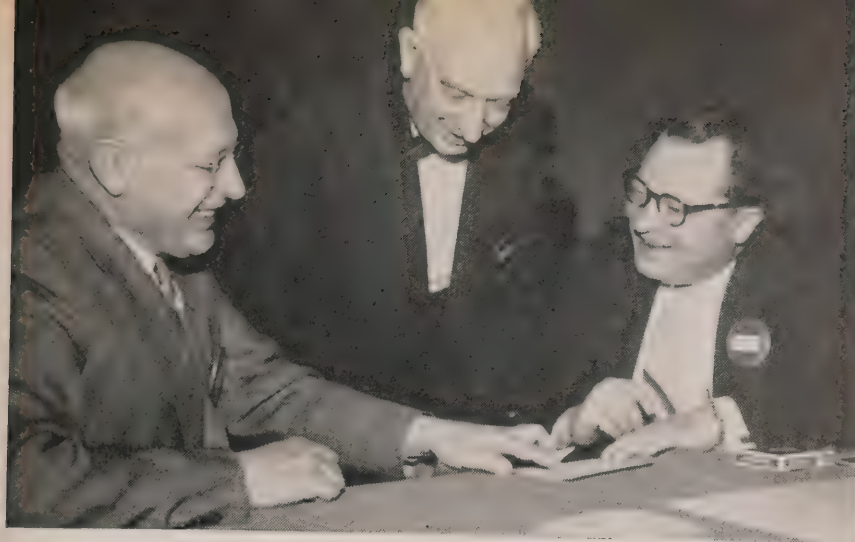
◁ GROUPS of delegates clustered around Ontario Hydro's model of the Nuclear Power Demonstration station being constructed at Des Joachims, Ont. Here Harold Hillier, Hydro Information Officer (pointing), is explaining details of the model.

# Convention



▷ CONVENTION floor provided a convenient meeting-place for delegates from all sections of Ontario while registration was in progress and between sessions.





▷ E. G. McCracken, Toronto (right), was noted telling one of his favorite stories to E. G. Gurnett, Belleville, and E. V. Dyke, Smiths Falls.

# Candid

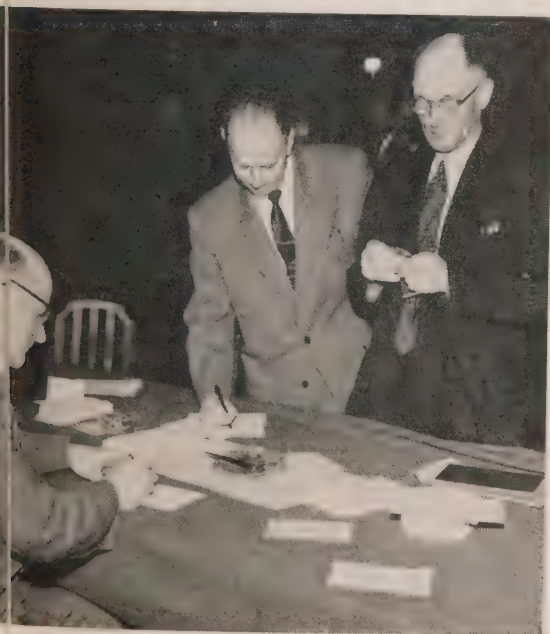
O.M.E.A. — A.M.E.U.  
CONVENTION, 1956

▷ A. W. BRADT, retired Manager of Hamilton Hydro-Electric Commission (right), smilingly adjusts convention button for W. R. Catton, who is retiring as Hydro Manager, Brantford P.U.C., in May this year.



ON can be a serious and engrossing business. The expressions on the faces of these three delegates, left to George Van Bridger, Bowmanville; Arthur Haywood, E.R. Wilkinson, Bolton, seems to confirm this opinion.

DISPLAY of literature being prepared by the Commission's Information Division to mark the Hydro Golden Jubilee this year is explained to, left to right: H. W. Smith, Waterford, and G. W. Grabb, Chesley, by W. A. Wall. The gold medallions are the Jubilee symbols.



# WARNING NOTES

**W**ARNING notes, not in any mandatory key, but rather with the confidence a man feels in tried and trusted comrades, were sounded by A. A. Kennedy, President of the Ontario Municipal Electric Association, in his main address to the delegates of that organization upon the occasion of its annual meeting at the Royal York Hotel in Toronto.

As an Ontario Hydro Commissioner, he was particularly well qualified to assess the type of co-operation that will be required in the future between the parent Commission and the family of Hydro municipalities.

Ontario Hydro, the speaker pointed out, is now making plans to meet anticipated, tremendously increased demands for power by all classes of customers in Ontario. Within 25 years, the total demand is expected to be five times the present figure. A good deal of the new power provided to meet this situation will be distributed to their customers by the municipal Hydro commissions and utilities.

"What sort of distribution systems will be needed to handle this demand for power?" asked Mr. Kennedy. "Is our present thinking, on a municipal level, geared to take

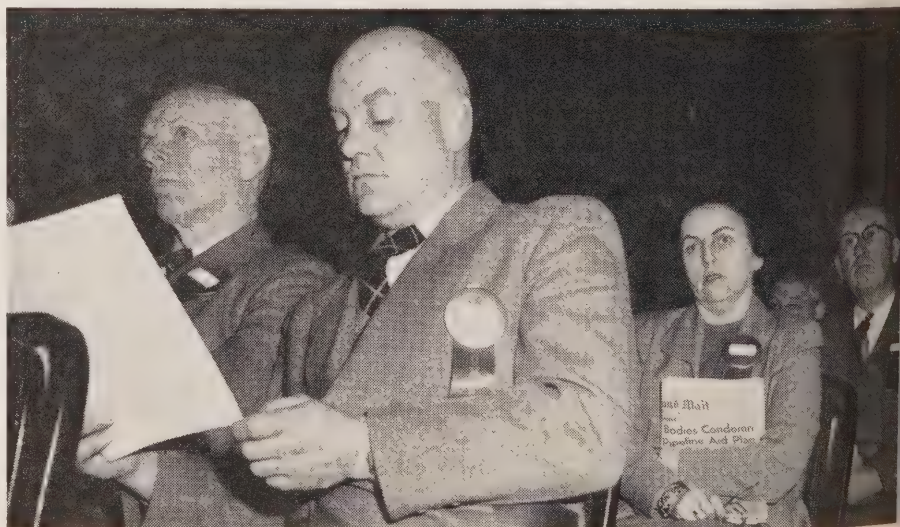
care of this load growth? Are we planning for not just the next two or three years but for the next 10, 15 and 20 years? If we are not, I can assure you that much of your new construction will be inadequate and will have to be replaced long before it wears out or before the debentures issued to finance it are paid."

## Getting Acquainted

Mr. Kennedy followed up these remarks by stating that, while co-operation between the Commission and the municipalities is traditional and, indeed, inherent in the principles upon which the whole Hydro structure is founded, nevertheless it is necessary to make it conform to changing conditions. In other words,

the municipal representatives must acquaint themselves, as never before, with what is taking place at Ontario Hydro, as well as at home.

"In order to acquaint municipal organizations more fully with the operations of Ontario Hydro," he told the delegates, "your directors have arranged a series of tours designed to show the varied operations handled at Ontario Hydro's Head Office in Toronto. These tours, so far as they have been carried out, have been most successful and we promise to continue them as long as there is sufficient interest. Full details are available either through your district organization or the Hydro Area Manager's office."



▷  
O.M.E.A. President Kennedy stressed the importance of gearing municipal distribution systems to meet anticipated load growth during his opening address to the delegates.



The importance of visiting the St. Lawrence Power Project was stressed, with the speaker suggesting the observance of three simple rules, which would add both to the enjoyment of the tour and an appreciation of the colossal tasks, which are being carried out. "Go in reasonably large parties, not less than 10," he advised. "Be prepared to spend a full day and, most important, let the Information Division either at Toronto or Cornwall know — at least three days ahead — the time when you will arrive, how long you propose to stay and the hotel accommodation you will require."

Stressing the importance of co-operation among the municipalities themselves, Mr. Kennedy stated that the Board of Directors of the O.M.E.A. has appointed a committee, which, for the past two years, in conjunction with representatives of the Association of Municipal Electrical Utilities, has been studying the feasibility of a plan permitting managers and foremen to visit other municipalities and study their methods of operation on an organized and friendly basis. Carrying out this plan, he intimated, will help to solve local problems and the knowledge gained, one from another, will lead to greater efficiency both in administration and in service to customers.

In 1949, the speaker stated, the Board of Directors of the O.M.E.A. requested the A.M.E.U. to study the possibility of standardizing the construction of the distribution systems in Hydro municipalities. Last year, financed by the O.M.E.A., the A.M.E.U. completed the first section of a manual on Municipal Standard Construction.

#### Golden Jubilee

Mr. Kennedy referred at some length to the celebrations associated with Hydro's Golden Jubilee year. In this connection, he drew attention to the fact that, while the Ontario Municipal Electric Association actually has been in existence "only" 47 years, it was virtually the



A. A. KENNEDY  
O.M.E.A. President

successor of the Niagara Power Union, which was formed in 1903 and which consisted of 14 municipalities in the Kitchener - London area.

"It was the vision and dogged determination of this group," the speaker recalled, "which persuaded the Ontario Government to pass the enabling legislation creating The Hydro-Electric Power Commission of Ontario in 1906."

Eulogizing the pioneers of "Hydro," Mr. Kennedy reminded his audience that, with the co-operation of the City of Kitchener and District No. 6 O.M.E.A., a ceremony will be held at St. Jacobs on May 14, at the site of the monument to the late E. W. B. Snider, in which

Ontario Hydro will participate. This ceremony will be followed by a gala dinner at Kitchener.

Referring to the tremendous growth and influx of population during the past years, Mr. Kennedy expressed the conviction that only a comparative few of Ontario's more than five million people "know the story of Hydro."

"It is our duty," he stressed, "to tell our customers this story and I can think of no better time than this year, when we celebrate half a century of undreamed of growth and a record of service both on the part of the provincial organization and the municipalities of which we can be very proud."

—by H. M. Blake.

# OUTSTANDING ACHIEVEMENTS



H. A. HOWARD  
A.M.E.U. President

COOPERATION of the Association of Municipal Electrical Utilities with Ontario Hydro and the municipal Hydro commissions in providing continually improved services to the people of Ontario was emphasized in 1955 by three outstanding achievements. These were outlined by Association President, H. Allan Howard, Thorold, in his inaugural address to A.M.E.U. delegates at their recent annual convention in Toronto.

First in importance, Mr. Howard pointed out, was the completion, after seven years of work and study, of the first section of the "Guide to Municipal Standard Construction." This portion, he said, deals with the problems involved in the construction of overhead power distribution systems and the building and equipment of associated stations. The second section will describe ap-

proved construction methods for underground systems and is expected to come off the press in June of this year.

"Thirty-eight men," stated Mr. Howard, "were members of the various committees employed in the gathering and preparation of data for the first section of this book, which has been made available to commercial firms as well as to our own municipalities."

The A.M.E.U. President stated that the request for a manual of this description came from the Ontario Municipal Electric Association, which assumed responsibility for the initial financing.

The second major project undertaken by the A.M.E.U. during the past year was to carry out a load study for the System Planning Committee.

"Some of the Hydro loads will be doubling in the next ten to fifteen years," Mr. Howard predicted. "We must appraise the situation collectively and determine a course of action."

Another undertaking of almost equal importance has been the work carried out by a Utility Study group, with a view to standardizing operations associated with municipal Hydro services. At the request of the O.M.E.A., the A.M.E.U. is continuing this activity and broadening its scope to include assistance to the O.M.E.A. in investigating the vexing problem of customer deposits.

## Working With C.E.A.

"Last December," Mr. Howard reported, "a committee met with the Chief Officer of the Canadian Electrical Association in Montreal and

it was agreed that, in future, our association will work with the C.E.A. to eliminate duplication and to exchange information for the benefit of the people of Canada." The A.M.E.U., he added, is now attempting to make arrangements with the Canadian Standards Association on a similar basis of mutual assistance.

Membership in the A.M.E.U. at the end of 1955 was recorded as the largest in the association's history, comprising 271 municipalities. Of this number, 67 took an active part in committee work. A.M.E.U. members participated in 98 meetings.

"We must realize that we are now accepted throughout Canada as an authoritative body in the electrical industry," Mr. Howard reminded his audience. "We must measure up to what is expected of us."

Praising the utmost "consideration and cooperation" accorded the A.M.E.U. by Chairman Dr. Richard L. Hearn and the Ontario Hydro staff during 1955, President Howard pledged a continuance of the happy relationship with the Commission.

Recalling the differences of opinion that have occurred in the past 50 years, the speaker said they have, in actual fact, resulted in the betterment of conditions.



C. S. PHELPS  
Sarnia



Offering his congratulations to Dr. Hearn, A. W. Manby, General Manager and other Commission representatives, Mr. Howard said the A.M.E.U. joined wholeheartedly with Ontario Hydro in the observance of Hydro's Golden Jubilee.

### Accident Prevention

Further investigations and tests, with a view to making the management and employees of electrical utilities more "accident conscious," were carried out last year under the auspices of the A.M.E.U., according to the report of its Accident Prevention and Health Promotion Committee. In presenting this report, Chairman Ronald Harrison, Scarborough Township, pointed out that most of the members of the committee are also members of the Managing Committee of the Electrical Employers' Association and so were in direct touch with the latest developments in accident prevention work.

During the past year a test line was built and research work on pole-top rescue and resuscitation carried out. The merits of various types of equipment were investigated and line work under varying conditions demonstrated. A new type of hard hat was recommended for use by repair crews.

A foreman's course on the fundamentals of accident prevention was given in four utilities and plans were made for its continuance during 1956. A booklet covering the curriculum was presented to each foreman upon completing the course.

Through the committee, the Electrical Employers' Association, during 1955, supplemented its training programs for electrical workers by the addition of two new colored slide films dealing with the use and care of protective equipment. A booklet was prepared on the selection and use of ladders.

During the year, resuscitation methods were again scrutinized and the committee reported that opinion still favored the Schafer Prone Pressure method, but advocated familiarity with other approved methods, including the Holgar-Nielson.

Mr. Harrison's report indicated that field safety supervisors have been kept up-to-date on the latest developments in accident prevention by attending courses arranged by the National Safety Council.

### Merchandising Report

The report of the Merchandising Committee for 1955, presented by C. S. Phelps, Sarnia, focussed its attention on Hydro shops.

"Checking amongst utilities," the report stated, "it was apparent that net profits earned had declined sharply in 1954 compared to 1953. The downward trend continued through 1955. This is a reflection of the unsatisfactory state of the electrical appliance retail market existing in almost every municipality operating a Hydro shop. Severe price competition, initiated by discount houses in the large centres and by local branches of nationwide department stores in smaller centres, is largely responsible. In view of this, the Merchandising Committee is exploring ways and means to help retain the position of Hydro shops in these markets."

It was recalled that, at the meeting of the Merchandising Committee last April, a resolution was adopted for presentation to the A.M.E.U. Executive Committee. This asked for a continuation of the supply of Hydro lamps and for active promotional assistance, presumably in the form of lamp displays and advertising. M. J. McHenry, Ontario Hydro, it was pointed out, prepared an excellent report on the history and development of the Hydro 1500-hour lamp since 1912. It is still the opinion of Ontario Hy-

*(Continued on page 16)*



RONALD HARRISON  
Scarborough Township



W. H. POWELL  
Peterborough



J. W. HAMMOND  
Hamilton



◀ IN RECOGNITION of his contribution to the A.M.E.U., the retiring President, Mr. Howard (right), received an illuminated address and an engraved silver tray presented by the Immediate Past President, A. W. H. Taber.

dro's Research Division that, considering the cost of electricity to the user and other factors of climate and economy, 1,500 hours is still the optimum life for an incandescent lamp. It is felt that, with adequate publicizing, the lamp's deserved favor with the public could be retained.

The committee's report drew attention to what it described as the coming "aggressive" competition of gas with electricity in the appliance field and suggested that Hydro shops could play an important part in meeting this competition.

#### Rates Committee

The report of the Rates Committee, presented by J. E. Teckoe, Jr., Windsor, recorded that new resale rate structures, recommended for the domestic, commercial and power classifications, have been approved by Ontario Hydro and are already in force in a few municipalities.

"The principles involved are not new in the electrical utility field," the report went on to state, "but the structures incorporate some of the more desirable features in use elsewhere and eliminate others, which experience has shown to be undesirable. Considerable flexibility will be permitted in the introduction of the new structures as commission approval stipulates that they are to

be put into effect gradually in individual municipalities as rate changes become necessary."

Mr. Teckoe instanced his own City of Windsor as a happy example of the results effected through a revision of the rate structure.

"Mechanical problems," he said, "have simply been non-existent and we are satisfied that we now have an equitable rate structure very much more in line with present conditions. Certain glaring inequities have been eliminated or minimized and public acceptance has been excellent."

#### Modified Plan

Since the last annual meeting of the A.M.E.U., the Employees Relations Committee has completed four surveys of wage rates in some 65 municipalities. This was announced by Ray Pfaff, St. Catharines, who presented the committee's report in the absence of the Chairman, J. W. Peart, St. Thomas. A continuing upward trend in the rates of pay during the past year was noted. There was a marked increase in the number of fringe benefits granted by the municipalities.

The report pointed out that, as the municipalities were not unanimously in favor of the proposal to appoint a special labor consultant, a modified plan is being considered

to make this service available to such municipalities as desire it.

#### Simplify Statistics

Simplifications in the presentation of statistics and their availability in a less confusing form to those who have to make use of them in the electrical industry have long been advocated by the A.M.E.U., which is now cooperating with the Dominion Bureau of Statistics, Ontario Hydro and the Canadian Electrical Association in an endeavour to see what can be done about it.

Intimation of this new activity was contained in the report presented by J. W. Hammond, Hamilton, Chairman of the Accounting and Office Administration Committee, which is giving an example of what can be done along the line of clarification by changing its name to "Administration and Finance Committee."

This is Ontario Hydro's Golden Jubilee year and many old records of the A.M.E.U. member utilities, which have been filed away for years, are being brought to light. Looking back into the past has brought up the question of how long records should be kept and of their ultimate disposal. A sub-committee, the report noted, will confer with Ontario Hydro's Records Officer in respect to the proper procedure.

Presented by W. Howard Powell, Peterborough, the report of the Communications Committee stated that municipalities complaining of encountering interference in their two-way radio operations were given all possible assistance as to the best way of remedying their troubles. To prevent further troubles, all municipalities were circularized on the procedures required to obtain frequencies in the special range reserved for utilities. —By H. M. Blake.



# STREAMLINE A.M.E.U. ORGANIZATION

**O**PERATIONS of the A.M.E.U. are to be streamlined in order to place it in a better position to deal with its growing responsibilities.

Discussing the proposed reorganization during a joint meeting of delegates at the recent annual O.M.E.A.-A.M.E.U. Convention, J. A. Williamson, Niagara Falls, Director-at-large and Chairman of the A.M.E.U. Committee on Reorganization, said his committee has paid particular attention to the statement of Dr. Richard L. Hearn that Hydro may be required to spend three billion dollars on expansion within the next 15 years.

"Obviously," Mr. Williamson stated "if Ontario Hydro spends that much money, a great expansion of municipal facilities will be required and, therefore, there will be a considerable increase of work for A.M.E.U. committees."

Commenting on the necessity of a thorough review of the work of all Committees before final acceptance, he said this study has, in the past, been undertaken by the Executive Committee, but the work load involved had proved excessive. It is felt that the reorganization should provide for an intermediate review of committee work before presentation to the Executive Committee for final action, Mr. Williamson stated. A special Publications Committee will be set up to handle the review of all reports, papers, regulations, etc.

The proposed reorganization provides that the Committee Organization be separated into four main sections, each headed by a Section Committee, to link the Committees



△  
DISCUSSING changes in A.M.E.U. organization, this group, left to right — F. G. York, Ottawa; C. B. Campbell, Trenton, and Lloyd Asquith, Ottawa, study chart illustrating the new plan.

with the Executive Committee. Under each Section Committee would be appropriate committees, and each could be divided further into sub-committees.

Mr. Williamson presented a chart showing that one of the four main bodies would be the Accounting Section Committee. The Eastern and Western Accounting Committees dealing with billing, collecting and records would report to this section committee.

The Management Section Committee would be responsible for the work of committees concerned with Accident Prevention and Health, Employee Relations, Merchandising, Pensions and Insurance, Public Relations and Rates.

The largest of the four sections — the Engineering Section — would deal with the work of committees on Communications, Metering, Overhead, Street Lighting, Substations, System Planning, Underground and Utilization Equipment.

The new streamlined procedure would mean that the A.M.E.U. Executive Committee would have to deal directly with only four Section main committees, instead of 22 separate committees. The consequent saving of time and effort would, therefore, place the Executive Committee in a better position to deal with the implications and the new responsibilities arising from the expansion of municipal systems.

*(Continued on page 20)*

# RECORD LOAD GROWTH

1955 primary power requirements totalled 4.2 million kilowatts

**S**OARING load growth and the steps Ontario Hydro is taking to meet it—a keynote struck by Hydro Chairman Dr. Hearn in his preceding address—was the basic theme taken and enlarged upon by General Manager A. W. Manby in the course of his review of the Commission's operations in 1955 presented to O.M.E.A.-A.M.E.U. delegates this year.

"Primary power requirements of Ontario Hydro's three systems reached a record level of 4.2 million kilowatts in 1955," Mr. Manby told his convention audience. "This represents an increase over the previous year of 14.3 per cent. In the Southern Ontario System, which accounts for about 85 per cent of the total demand for power, the rate of increase during 1955 was 13.4 per cent, compared with 14.8 per cent and 21.5 per cent for the North-eastern and the Northwestern divisions respectively."

Undoubtedly, said Mr. Manby, this unprecedented demand for power is a direct reflection of the great economic expansion of the province. It is also an indication that Hydro must be prepared to meet a future load growth exceeding even that experienced in the immediate postwar years.

Delegates were interested to hear that the energy requirements of municipal electrical utilities climbed by approximately 10 per cent over the past year. Energy demands in the Rural Power District were up by almost 12 per cent, while primary energy supplied to Hydro's direct industrial customers showed an increase of more than 17 per cent.



Ontario Hydro met this call for power with resources amounting to 4.5 million kilowatts, being greatly assisted by the increased generation available from the new Niagara Project and the return to service of two units at the Richard L. Hearn steam station in Toronto. During the year the Commission recorded an increase of 18 percent in the net output of electric energy from all sources. This output represented 26.6 billion kilowatthours, of which Ontario Hydro's generating stations produced 22.5 billion kwhrs., the remainder being purchased from other sources.

## Less Reserve Margin

Despite a 9.6 percent increase in generating capacity during the past year, Mr. Manby continued, the margin of reserve was slightly less than in 1954. Minor load reductions were necessary in the Northwestern Division where the peak demand was approximately equal to resources. Supply to the North-eastern Division from resources of the Southern Ontario System was improved by the addition of frequency-changer equipment in the division, by isolating certain units at Otto Holden and Des Joachims Generating Stations to supply loads in the north and towards the end of the year by reinsulation of one of

the system 115-kv. interconnections for 230-kv. operation.

Mutual benefits were felt during the year from the occasional operation of the Southern Ontario System in parallel with neighboring utilities. Interconnection with other systems was extended in May, 1955, by placing in service a 230-kv., 60-cycle interconnection with the Niagara Mohawk Power Corporation across the Niagara River.

To conserve water for use later in the year, purchases from Quebec suppliers were curtailed during the severe stages of the water shortage, which occurred last summer and during the early fall. Full advantage was taken of the water available under the terms of the Niagara Diversion Treaty by operating the Sir Adam Beck plants at high load factor.

Turning to the Commission's construction activities, Mr. Manby briefly touched upon the measures being taken to bring in additional capacity by the St. Lawrence Power Project. In addition, he said, work is pushing ahead on the Manitou Falls Generating Station on the English River, some 20 miles below Ear Falls. The new station, which will serve the Northwestern Region, would go into initial service in the latter part of March this year. By July, it is expected to have all four units with a total capacity of 54,400 kilowatts in operation. Provision is being made for the possible addition—in the future—of a fifth unit.

The Whitedog Falls Project in northwestern Ontario is also well under way. Situated on the Winnipeg River about 12 miles east of the





A. W. MANBY, General Manager, Ontario Hydro

Manitoba border, some 30 miles northwest of Kenora, this station will comprise three units with a combined capacity of 54,000 kilowatts. Initial power is scheduled for delivery in December, 1957.

Further resources to meet the expected demands of 1958 will be forthcoming from two additional units, one at Cameron Falls and one at Alexander, totalling 31,500 kw. for the installation of which the Commission gave its approval just one week before the date of the convention, Mr. Manby said. Their implementation will enable full advantage to be made of available storage on the Nipigon.

Further protection to the people of the province in the matter of power supply will come from the installation of four additional 75,000-kilowatt units at the Sir Adam Beck - Niagara Generating Station No. 2. Two of these units will be available in time to meet the 1957 peak demand; the other two are scheduled for service in 1958.

Decision has also been made, said Mr. Manby, to increase the capacity of the Richard L. Hearn steam station on Toronto's waterfront. In-

stead of an ultimate development of six units with a total capacity of 600,000 kilowatts, as originally contemplated by Hydro, plans are now complete for the installation of units of much larger capacity. One such unit, with a capacity of 200,000 kilowatts, is scheduled for service by October 1, 1958. Provision will also be made for the addition of two similar units at a later date.

### Circuit Highlights

So widespread was construction activity in regard to transformer stations and transmission lines during the past year, Mr. Manby told his listeners, that time permitted only a review of the highlights. Notable among these was the incorporation of additional sources of power into the Southern Ontario System and the consequent rearrangement of circuits at Essa, Detweiler and A. W. Manby Transformer Stations. At the Leaside Transformer Station, the first stage in the standardization to 60-cycle operation was carried out. Three new stations were placed in service in the Toronto area. In the Northern Ontario Properties, two new transformer stations were inaugurated, one supplying the

Blind River area, the other serving the Port Arthur district.

The increasing difficulty of obtaining rights-of-way is annually placing more stress on the importance of underground cable. In this regard, two directly-buried, oil-filled cables — the first of their type to be used by Ontario Hydro — were placed in service in Toronto during the past year. The work of installing approximately 10 circuit miles of underground cable is also proceeding in Toronto and Ottawa. A further 12 miles will be required when the Toronto Lakeshore Expressway is constructed.

In Northern Ontario some 140 miles of 115-kv. line were completed to extend the transmission network serving mining customers and town-sites in the Manitouwadge and Blind River areas and to improve supply to the Kirkland Lake district.

Larger transfers of power between the Southern Ontario System and the Northeastern Division will be made possible by reinsulation of the 105-mile line between the Otto Holden Generating Station and the R. H. Martindale Transformer Station for 230-kv. operation.

Concluding his report on the construction picture, Mr. Manby mentioned that the Commission has adopted a new basis for transmission tower design following a reevaluation of basic structural loadings governing tower design.

"Ontario Hydro's gross revenue increased by about 14 percent during 1955 to reach almost \$167 million, with the cost of providing service increasing in about the same proportion," said Mr. Manby.

The cost of providing service, he continued, includes assessment in the Niagara Division only of five dollars per kilowatt for frequency standardization and the adjustment applicable to all divisions of the Southern Ontario System required by the last of three yearly steps in the pooling of 230-kv. transmission costs. Interest on the fund accumu-

*(Continued on page 20)*

lated for the purpose of maintaining a ceiling on the cost of power to the utilities was adequate to hold the cost of power to a maximum of \$49.79 per kilowatt. Twenty-two municipalities obtained the benefit of this relief in their cost of power for 1955.

Mr. Manby proceeded to review the reasons behind the decision to pool costs of 115-kv. transmission. The pooling of bulk transmission costs throughout the Southern Ontario System, he said, is an inevitable result of expansion. In the early years of the system, it was relatively simple to establish the source of power supplied to a municipality and calculate the costs of transmission. Later it became impossible to do this in regard to 230-kv. power and the cost, therefore, has been equalized, in gradual steps, throughout the system for the past three years.

In respect to 115-kv. transmission, a similar situation now exists. In proposing to pool 115-kv. transmission and equalize costs, the Commission is merely adapting its costing methods to the changing needs of progress. With the construction of large fuel-electric stations, the development of interconnections with neighboring systems and the complexities of modern operating conditions, it is no longer reasonable to assume any particular source of power for a specified customer.

### New Rate Structure

Commenting on the proposed revision of the municipal resale rate structure, Hydro's General Manager pointed out that it is designed to produce a more equitable division of cost among the various classes of customer. Already in force in Windsor and Niagara Falls, the new rate structure for domestic customers will have four blocks instead of the present two. This means the cost will be based on consumption of energy in stages of 50, 200, 500 and all additional kilowatthours. A progressively lower rate will be charged for the first three blocks,

but the rate for the fourth block will be higher than that for the third. For commercial and power customers only the first rate will vary. The monthly kilowatt-demand charge and the second and third rates will be the same in all municipalities.

A review of operating statements has shown there are municipalities with surpluses large enough, added Mr. Manby, to warrant rate adjustments, and it is expected that many will adopt the new rate structure by the end of this year. Minor adjustments will be considered if there are sound reasons for introducing the new rate structure gradually.

### Standardization Progress

An interesting sidelight to Hydro's frequency standardization program was disclosed by Mr. Manby when he mentioned to delegates that the Commission took advantage of its interconnections with other systems to dispose of large amounts of surplus energy, which would otherwise have gone to waste. The revenue from this source, which has been used to defray part of the standardization program, amounted to more than \$4 million in 1955.

Total cost of the standardization program to the end of 1955 amounted to approximately \$243 million, of which more than \$19 million has been expended for equipment, supplies and other assets to be used for future standardization work, leaving a net cost of \$223.6 million for work completed.

"In the course of the year," said Mr. Manby, "the services of 129,000 customers were standardized, bringing the total to more than 600,000. This operation involved the standardization or exchange of some 921,000 electrical items in 1955 to bring the total for the program to almost four million."

Development of the rural economy of the province is making increased demands upon the resources of Ontario Hydro, the General Manager continued. To

serve the rapidly-increasing number of customers in rural areas, Ontario Hydro has doubled its network of rural primary lines in the preceding 10 years to a 1955 high of 43,850 miles.

After expressing his personal thanks to Hydro personnel for their help during the past year, Mr. Manby concluded with the following tribute to members of the O.M.E.A. and the A.M.E.U.

"Whatever phase of the Hydro operation we take," he said, "the emphasis is on expansion. This has placed a tremendous responsibility on the shoulders of us all, and I should like you to know how much we appreciate the cooperation you have given our staff in carrying out their duties." —*by J. J. Kirkwood.*

## STREAMLINE A.M.E.U. ORGANIZATION

*(Continued from page 17)*

Noting that the probable increase in work dictated by this expansion would necessitate additional income in the near future, Mr. Williamson said an amendment to the constitution permitting a new scale of fees to become effective in 1957 has been approved.

Another aspect of this interesting and comprehensive report was the speaker's reference to the Canadian Electrical Association. Mr. Williamson reported the Executive Committee's opinion that a closer relationship with this body is considered highly desirable and a separate committee is studying this problem. It is felt that the A.M.E.U. should not attempt to duplicate the work of the C.E.A., but rather to amplify and take part in it, concentrating on the application of electrical components into systems. He recommended that the A.M.E.U. accept the work of the C.E.A. pertaining to the standardization of components, at the same time actively assisting the C.E.A. Committees in their standardization program. —*by Frank C. Wood.*



# ASSOCIATIONS ELECT OFFICERS



E. A. WASHBURN, Stratford, President-elect of the A.M.E.U. (left), proudly accepts his new gavel presented by the newly-elected President of the O.M.E.A., Gordon H. Fuller, Windsor.

**E**LECTED to the O.M.E.A. presidency at this year's convention was Gordon H. Fuller, Windsor, who has been associated with the city's utilities commission for the past 15 years.

Mr. Fuller, who succeeds A. A. Kennedy, retiring after a second term, brings to the post a successful background in the worlds of business and sport. In addition to the establishment of his own construction company in Windsor, now a family business in which he is assisted by his son and son-in-law, the new President has a record in public affairs extending back to 1928. In that year he was elected to Windsor's Board of Education. After seven years' service, leading eventually to the Chairmanship, he dropped out of civic life until he was elected to the Windsor Utilities Commission in 1941.

In addition to his 15 years with that commission, including five as chairman, Mr. Fuller has also been President of District 8 O.M.E.A. on five occasions and a member of the executive for nine years.

In the field of sports Mr. Fuller's interests cover basketball, football and softball. Between 1928 and 1936 he was either coach, manager or a member of no less than 16 Ontario Senior Championship teams. He coached Canada's 1936 Olympic basketball team and attended the games in Berlin that year when they suffered a nine-point defeat at the hands of the U.S. squad to lose the world championship. Last year he was President of the Windsor Senior Softball League, but will probably step down this year to devote all his time to O.M.E.A. affairs. A native of Windsor, Mr. Fuller is

married with a son and daughter and four grandchildren.

Edward A. Washburn, General Manager of Stratford P.U.C. since 1954, was this year's choice for the A.M.E.U. presidency. He succeeds H. Allan Howard, Thorold, who ably headed the Association during the past year.

Born at Comber, Ontario, near Windsor, Mr. Washburn is a graduate of Queen's University, having obtained his Bachelor of Science degree there in electrical engineering in 1943. After graduation he entered the RCNVR with the rank of Lieutenant and was engaged in the installation and maintenance of anti-submarine equipment aboard naval vessels until 1945.

On leaving the service, Mr. Washburn joined Ontario Hydro in the capacity of junior engineer, going to Ingersoll P.U.C. a year later where he was Manager from 1947 to 1950. In 1950 he moved to Stratford as Assistant General Manager of the local utility moving up to the managership in August, 1954. An active Rotarian and a member of the Association of Professional Engineers of Ontario, Mr. Washburn served as A.M.E.U. vice-president last year.

Married and the father of a twelve-year-old son and nine-year-old daughter, the new President is an accomplished musician — having spent five years touring with a band after completing high school.

## O.M.E.A. Officers

Ontario Hydro's Chairman, Dr. Richard L. Hearn, was re-elected as Honorary President of the O.M.E.A., while Fred Biette, Chatham; K. A. Christie, Q.C., Toronto; C. J. Halliday, Chesley; H. O. Hawke, Galt; G. F. Hutcheson, Huntsville, and M. J. Elliott, Bowmanville, were elected as Honorary Vice-Presidents.

District Vice-Presidents for the year will be: J. G. Baldwin, Lindsay; C. J. Halliday, Chesley; C. H. Moors, Fort William; Bert Merson, Toronto; W. B. Elliott, St. Cath-

*(Continued on page 48)*

# ACTIVE YEAR

DESCRIBING 1955 as "a very active year" for the Electric Service League of Ontario, President W. N. Herod, in presenting a report of League activities to delegates at this year's O.M.E.A.-A.M.E.U. annual convention, stated that 10,022 homes were certified as "Red Seal" homes last year.

"In considering the number of certifications, it is well not to lose sight of the large number of houses not up to 'Red Seal' standards, but in which the wiring has been improved through the efforts of the League."

While the activities of the League in the past have been concerned mainly with the promotion of Red Seal wiring in new homes, it is becoming increasingly imperative that attention be given to rewiring of old homes in which the increased use of electrical appliances has emphasized the inadequacy of existing wiring installations.

Referring to the recent appointment of Manager Harry J. Foy, who was introduced to the assembly, Mr. Herod dealt at length with the concentrated efforts made to impress upon the public the need for adequate wiring installations.

## Film Available

A film entitled "The Magic Link" was purchased during 1955 and is now available on loan, Mr. Herod reported. In addition, the League procured over 600 copies of a recent cover of the *Saturday Evening Post* showing a housewife replacing burned-out fuses. Mounted



W. N. HEROD  
Toronto

on an easel, and with the League's name printed at the top, these pictures are available for distribution as effective display pieces. Further interest in the League's work was created by three, recent front-page articles on adequate wiring carried by *The Toronto Telegram*.

In addition to answering a large number of telephone calls from people who had read these articles, the League staff made 30 or more personal visits to premises where recommendations were made to the owners, the League President stated. Plans are being made for the distribution, in certain areas, of about 2,000 reprints of these articles, to be delivered with the Hydro bills.

"The League will be pleased to forward a sample copy of this reprint to any utility with the suggestion that they circularize their customers in a similar way," he pointed out.

The work of the League in promoting Red Seal wiring has been greatly strengthened by the co-operation of the Electrical Contractors Association of Ontario. To outline the program and activities of the E.C.A., Mr. Herod introduced C. W. Dent, Vice-President of the Association, who reported in

the absence of Roland DeMers, President.

## Registered Contractors

Last year, Mr. Dent stated, the Ontario Legislature amended the Municipal Act to give municipalities the permissive power to accept the E.C.A. of Ontario Registration Plan in lieu of a municipal license bylaw covering those engaged in making electrical installations in the various municipalities. Mr. Dent explained that this arrangement means the municipalities are asked to pass bylaws stipulating that in order to practise the trade of electrical contractor in the municipality, the contractor must be registered. Registration involves passing an Association examination and being bonded under the bylaws of the E.C.A. of Ontario. Already eight municipalities have passed the necessary bylaw and many more have the matter under consideration.

"So far," the speaker said, "this is a voluntary registration, but it has always been a fact that the responsible businessman is ready and willing to subscribe to any plan for the improvement of the industry in which he earns his livelihood. This is indicated by the fact that



we now have nearly 700 Registered Master Electricians throughout the province, who have voluntarily registered."

One other important aspect of the work of the association was discussed by Mr. Dent. In an effort to improve electrical installations and alert the public to the dangers of defective or inadequate wiring, the Association has formed a joint committee with the Electric Service League of Ontario "to get down to the grass roots of the trouble." A comprehensive plan has been set up to put into action and sell to the public at the customer level all of the recommendations of the Cana-



C. W. DENT  
Toronto

dian Adequate Wiring Bureau, the Electric Service League and other associations, which are attempting to make every electrical customer conscious of the need for adequate wiring in new buildings and modernization of existing installations in older buildings.

In conclusion, Mr. Dent assured the delegates that support of the E.C.A. of Ontario would help the association become stronger and better organized, enabling it to take an increasingly active part in the continuing improvement of the electrical industry throughout the province.—by *W. T. Delworth*.

# He Saved a Life



△  
DON CAMERON, Secretary-Treasurer and Engineer, Electrical Employers' Association (left), congratulates James Blackie, Galt P.U.C. employee, after presenting him with a scroll and the President's Medal on behalf of the National Safety Council at this year's convention.

**J**AMES BLACKIE, an employee of Galt Public Utilities Commission was washing windows outside his home on Thanksgiving Day, 1955.

Suddenly he heard frantic shouting and ran towards the source of the noise. Arriving at a nearby home, Blackie found Mrs. I. F. Adamson standing over the body of her 18-months old son, Brian. This little boy had fallen into an 18-inch upright tile pipe in the ground, which had become filled with water during recent rains. Although he had been pulled from the water by his mother and three-year old brother, the child was not breathing when checked by Mr. Blackie.

Trained in the Schafer Prone

Pressure method of resuscitation for a number of years at the Galt Public Utilities Commission, Mr. Blackie immediately commenced artificial respiration.

After receiving this treatment for five minutes, the child began to breath voluntarily and shortly afterwards the family physician arrived.

At this year's O.M.E.A.-A.M.E.U. annual convention, Mr. Blackie was recognized for having "Saved a Life" when he was presented with the President's Medal from the National Safety Council by Don Cameron, Secretary-Treasurer and Engineer of the Electrical Employers' Association. ■

# JUBILEE TRIBUTE

OVER a half-century ago, representatives of a few Ontario municipalities launched a vigorous campaign to develop and distribute electrical power on behalf of the citizens of Ontario.

Despite the seemingly insurmountable obstacles of determined opposition in some quarters; indifference and sometimes outright derision in others, their movement slowly gained momentum.

The issue was resolved in May, 1906, when Ontario's legislators passed an historic act enabling the formation of The Hydro - Electric Power Commission of Ontario.

Today, 50 years later, that infant organization — now a billion-dollar, province-wide enterprise—is marking its Golden Jubilee in partnership with 343 municipalities, which are now associated with the world-famous public utility.

It was fitting, therefore, that the descendants of those pioneer municipal officials, as represented by the now-flourishing Ontario Municipal Electric Association and its sister organization, the Association of Municipal Electrical Utilities, should have chosen their 1956 joint annual convention to launch the observance of the Hydro Golden Jubilee.

At the convention's main banquet, the great audience rose and ap-

plauded as a four-tiered anniversary cake, ablaze with candles, was carried the length of the huge banquet hall to the head table where the symbolic cutting ceremony was jointly performed by O.M.E.A. President A. A. Kennedy and A.M.E.U. President H. A. Howard.

## Veteran Commissioner

The honor of proposing the toast to Ontario Hydro was accorded George F. Hutcheson, of Huntsville. Mr. Hutcheson came to the central role in the initial Hydro Golden Jubilee celebration this year eminently fitted by virtue of his 27-year association with the Huntsville Public Utilities Commission, many of these years having been spent as chairman of that commission. Personifying Hydro service in the municipalities of Ontario, Mr. Hutcheson has also been an energetic participant in the activities of the O.M.E.A., which, he has served, in recent years, both as President and Secretary - Treasurer of the parent association, as well as an executive member of the Georgian Bay M.E.A.

Mr. Hutcheson's address, which preceded the traditional toast, is reprinted in full herewith:

"I feel highly honored this evening in being asked to propose this toast inasmuch as I have, for many years, been keenly interested in

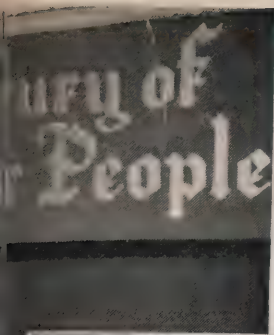
Hydro matters both through a public utility commission and the O.M.E.A. and to have had, in a small way — as each of you have had — something to do with its development and what it is today. Each one of us is a part of Hydro and each of us has some responsibility in its operation.

"For a moment let us take a brief look at Ontario shortly after the turn of the present century, when we find much hardship and distress in industry and to its citizens resulting from a severe coal shortage caused by a strike in the coal mines of the United States. At the same time our people saw the waters of the Niagara and other rivers tumbling, practically unharnessed, over the falls, and wondered whether this potential energy could not be used to generate electricity to turn the wheels of industry and to light their streets, homes, stores and factories, so that they would not be so dependent on the coal mines of the United States.

"A few men caught the vision of what the development of Hydro power would mean to the province and went up and down the country exhorting the municipalities to band together in an endeavor to have legislation enacted to enable them to purchase or develop electric power and have it transmitted to







△ LAUNCHING the observance of Hydro's Golden Jubilee this year, George F. Hutcheson, Huntsville, an O.M.E.A. Past President proposes the toast to Ontario Hydro.

REPRESENTATIVES of Clinton P.U.C., left to right: A. J. Deseck, H. E. Hartley, Mayor W. J. Miller, Chairman W. E. Perdue and C. W. Brown examine a Jubilee banner, one of which will hang in the local commission office.



MANIFESTING a "Jubilee-ant" mood as the four-tiered cake is carried through the banquet hall are A.M.E.U. President H. A. Howard, left, and O.M.E.A. President A. A. Kennedy, Ontario Hydro Commissioner.

their respective municipalities. Early in 1903 we find representatives of 17 municipalities meeting in Berlin and adopting a resolution urging the government to build a transmission line from Niagara Falls to the towns and cities. In the same year, legislation was passed giving the municipalities power to construct works for the distribution of electrical energy; but the municipalities could not do this alone. Finally under the leadership of Adam Beck, enough pressure was brought to bear on the government and in 1906, just 50 years ago, legislation was introduced setting up the first Hydro-Electric Power Commission of Ontario. The first municipality to receive Hydro was the City of Berlin in 1910. Such, in brief, was the beginning of this organization.

#### "Humble Gratitude"

"Today, when all our people are heartily in favor of public ownership of waterpower resources, it is difficult for us to realize the prejudices and opposition it was neces-

sary to overcome in those early days and the difficulties encountered in creating sufficient public opinion to put over the Hydro proposition. Today, as we look back over a half century, we must bow our heads in humble gratitude that men, first like Mr. D. B. Detweiler and Mr. E. W. B. Snider, and then Sir Adam Beck, had the courage and fortitude to persist in their crusade. Perhaps they did not foresee the tremendous growth of the Hydro enterprise or the boon, which it would bring to our people and the Province of Ontario, but they had a great vision, a vision sufficient to enable Hydro to be built on a firm foundation so that it has stood secure throughout the years of its unparalleled progress. How much we owe to these early leaders, the governments which enacted wise legislation, the Chairman and Commissioners of the H.E.P.C. who have held office during the years, the heads of departments and the engineers who have erected the gigantic generating stations and transmission

lines, and lastly, the municipalities and rural areas for whom the power is generated, represented here tonight by the members of the O.M.E.A. and A.M.E.U., all of which comprise the Ontario Hydro.

"I am not going to speak of its wondrous growth or blessings which it has brought to the Province of Ontario. All you need to do is to look about you. Tonight we pause for a moment and look backward over the years, then we turn about and look forward into the future, confident that with wise leadership, the affairs of Hydro will continue to progress, generating power from fuel and nuclear-electric sources as well as from falling water. May those who celebrate the centenary of Hydro, 50 years hence, be able to say that we have passed on to them as great a heritage as that which has been given us.

"Ladies and Gentlemen: I ask you to rise and join with me in drinking a toast to Ontario Hydro."

(Continued on page 28)

# MAJOR PROJECTS

Chief Engineer reviews progress at Niagara and St. Lawrence developments

ONTARIO Hydro has entered upon the year of its Golden Jubilee with a record of achievement crowned by two of the major engineering undertakings of the 20th century — the final stages in harnessing the Canadian side of the mighty Niagara cataract and the first steps towards realizing the visionary dream of power from the turbulent St. Lawrence River.

To Dr. Otto Holden, Ontario Hydro's Chief Engineer, fell the task of relating to O.M.E.A.-A.M.E.U delegates at their annual convention the work done by the Commission during the past year at both projects — one in the ultimate phase of its development, the other yet in the initial stages of construction.

Dr. Holden commenced his address with a detailed report of the Commission's activities at Niagara. During 1955, he said, the last of the twelve units planned for the initial phase of the Sir Adam Beck-Niagara Generating Station No. 2 was placed in service, although the original schedule had not called for installation of the final unit until early in 1956.

Efficiency tests on nine of these units yielded excellent results: in all cases, efficiency was above the guaranteed 91 per cent. A maximum of 94.5 per cent was secured and average efficiency for the nine units was calculated at 93.7 per cent.

"It is worthy of note," Dr. Holden said, "that for a range in load of 41,000 to 82,000 kilowatts an efficiency of 90 per cent or over was secured. An output of some 15 per cent above rated capacity was secured."

Tests on the twin Niagara tunnels were equally encouraging. Not only did they reveal a comfortable mar-

gin of carrying capacity over the designed flow, but ice conditions in the Niagara River during the winter of 1955 conclusively demonstrated the effectiveness of the intake structures in excluding ice without impairing carrying capacity of the tunnels.

Satisfactory headway was made during the year on the pumping-generating station. Three-quarters of the work was completed on the rock-fill dykes with their water-tight, clay blanket; concreting of the generating station substructure began in August, and the embedded parts of the first of six units are now being erected. Manufacture of the reversible pump-turbines is well advanced following careful research on this type of unit.

Present indications are that the scheduled in-service date of January 1, 1957, for the first unit will be achieved. The remaining units are scheduled for service at subsequent intervals of six weeks.

## Powerhouse Addition

"To provide greater peak capacity," said Dr. Holden, "the Commission has authorized the addition of four units to the powerhouse at the Sir Adam Beck-Niagara Generating Station No. 2. Provision for these units had been made in original construction of the headworks and forebay, and in facilities for dewatering the draft tube area."

The first of these four units, continued Hydro's Chief Engineer, is scheduled for service in time to meet the heavy load demand expected in the fall of 1957. All major generating equipment, powerhouse superstructure steel, penstocks and other permanent materials have been contracted for and excavation on the cliff face is already under way. The

second unit is expected to be in service by the end of 1957 and the remaining two in the summer of 1958.

## Remedial Works

The past year has also seen excellent progress made on the remedial works required under the 1950 Niagara Diversion Treaty. Completion of excavation on both flanks of the Horseshoe Falls has resulted in an unbroken sheet of water from shore to shore as predicted from the model tests.

Work on the control dam at the head of the Upper Cascades has reached the point where four of the projected thirteen, 100-foot gates are now in operation. Current construction is being carried on with five of the remaining gates. The final four will, it is believed, be completed by July, 1957.

Purpose of this control dam will be to regulate the level of the Grass Island Pool and the flow of water over the falls. Although it is being built on the Canadian side, and by Ontario Hydro construction crews, the costs of both the control dam and excavations above the Horseshoe Falls are being shared equally with the United States.

The total labor force on the various Niagara projects, Dr. Holden added, remained reasonably constant at 1,400 to 1,600 throughout the year. With completion of the pumping-generating station, the remedial works and the powerhouse extension, full development of Ontario's share of the Niagara power potential, as provided by the Treaty, will have been achieved.

## St. Lawrence Power

"Since final clearance to the St. Lawrence Power Project was given





DR. OTTO HOLDEN, Chief Engineer, Ontario Hydro

in June, 1954," said Dr. Holden, turning to the second part of his address, "work has proceeded rapidly. On the engineering side, all major structures and channel improvements have been designed except the tailrace channel. Barring contingencies, we believe the scheduled date for raising the water level in the summer of 1958 will be met. Power should be available shortly after."

Behind this prediction lies a story of immense effort and achievement: 34 major construction contracts and numerous small ones have been awarded, with five contracts for extensive excavation still to be placed; all major generating equipment for both powerhouses and the gates and gantry cranes for the Long Sault dam and the Iroquois control dam have been ordered; the planning of New Iroquois, the new section of Morrisburg, and the new towns with the proposed names of Wales and Long Sault is nearing completion, and much of the housemoving and rehabilitation of Iroquois has been effected.

Dr. Holden outlined the major construction steps as follows:

Channel improvements with both dry excavation and dredging operations are well underway at several locations. Five further contracts for this work will be placed shortly.

The Iroquois dam, to control the outflow from Lake Ontario, is being constructed in two stages. The first stage, on Rockway Point, is scheduled for completion in the spring of this year, and concrete is now being placed at the site. The whole structure should be finished in December, 1957.

The first of three stages of the Long Sault dam is underway. The site has been unwatered and a considerable amount of concrete placed. Excavation of channels preparatory to Stage 2 is nearing completion. The entire structure is scheduled to be finished in July, 1958, to permit the raising of the water in the forebay to operating level.

The powerhouse site has been unwatered and excavation of the earth overburden to expose the rock has been largely completed. The powerhouse is divided at the International Boundary and each half is being constructed by the respective agency.

The main cofferdam, said to be the largest of its type ever built, is 4,500 feet long and is composed of 60 circular steel-sheet piling cells, each 60 feet in diameter. First concrete was placed at the shore end of the Ontario Hydro powerhouse on February 17, 1956. Rock excavation for the draft tubes is proceeding and main concreting operations for the powerhouse substructure will begin early this spring. The powerhouse is scheduled for completion in the summer of 1958.

Good progress has been made on the long, earth-fill dykes extending upstream from the shore ends of both powerhouses to contain the headpond. These earth dams are in some places 80 feet high, and the native soil of which they are being built, known as 'glacial till,' has a density such that its unit weight approaches that of concrete when compacted in the dykes.

#### Many Problems

Apart from the actual power works, said Dr. Holden, there are several extraneous items connected with the St. Lawrence Power Project. One of the major of these is the relocation of approximately 40 miles of the Canadian National Railway's double-track main line from Montreal to Toronto. Work on the new line is well advanced and it will probably be ready for traffic early in 1957.

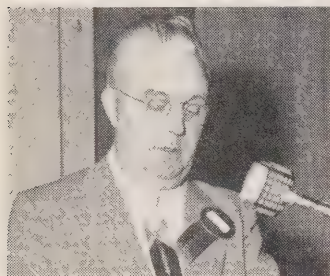
Some 30 miles of new highway must be built due to the eventual flooding of Highway No. 2 between Iroquois and Cornwall. Seven miles of this new road, diverting traffic from the concentrated powerhouse area, are already in service. A large saving will result from taking advantage of the present C.N.R. roadbed in constructing approximately 10 of the remaining miles.

#### Rehabilitation

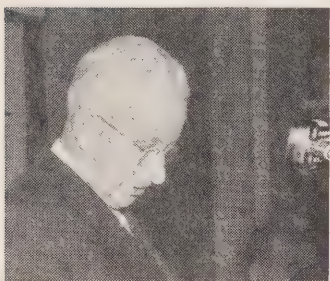
A complex problem, continued Dr. Holden, is the acquisition of the 2,000 properties affected and the relocation of 6,500 people, as well as businesses and industries, at present in the section to be flooded.

*(Continued on page 28)*

## AMONG THE SPEAKERS



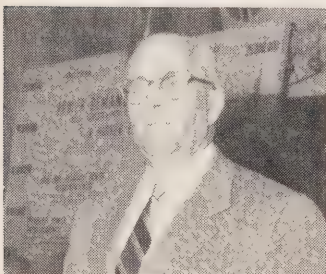
A. "SCOTTY" HAMILTON  
Forest Hill Village



R. E. JONES  
Ontario Hydro



J. M. HAMBLEY  
Ontario Hydro



GORDON H. FULLER  
Windsor

## JUBILEE TRIBUTE

(Continued from page 25)

Responding on behalf of Ontario Hydro, which he has served in many prominent executive capacities over the past four decades of its history, Dr. Richard L. Hearn, the present Chairman of the Commission, voiced appreciation of this warm tribute in the following brief address:

"It is a very great honor to reply, on behalf of Ontario Hydro, to the toast so kindly proposed by Mr. George Hutcheson. As we approach the celebration of the Golden Jubilee of Hydro in Ontario, I think it is time to recall those early pioneers mentioned by Mr. Hutcheson and to remember the great debt of gratitude which we and, in fact, all the people of Ontario, owe them.

### Must Emulate Spirit

"Some 50 years ago, a group of men representing 14 municipalities were responsible for the start of a great provincial movement, which was to lead to the natural water resources being shared by all the people rather than being used for the benefit of the few. But we must be more than grateful to these men. We must emulate their pioneering spirit and I am proud to say that the Ontario Municipal Electric Association has proved to be a credit to the whole Hydro organization in this regard. The leadership provided through the years by the representatives of the O.M.E.A. has been responsible for building those original 14 municipalities into the 343 that we have today. Through their untiring efforts, they have built an economy which has resulted in the increasing markets for power.

"I shall not attempt to measure in cold statistics the contribution which you and your predecessors have made to the welfare of Ontario, but I do think this is the opportunity to say that your proud record of the past provides us with confidence to face the challenges of the future.

"Thank you."

## MAJOR PROJECTS

(Continued from page 27)

The areas concerned are the communities of Iroquois and Morrisburg and the townships of Osnabruck and Cornwall. At Iroquois a complete new townsite has been developed on modern principles and has met with favorable acceptance. Over 100 houses have been moved by the Commission from the former site to the new.

At Morrisburg, approval has been given to a general plan for a new section of town to replace that which will be affected. Some details have yet to be finalized, but tenders for the new water and sewer systems will be called early in April and the moving of houses and businesses will commence when these contracts have been fulfilled.

For the remaining sections, two new towns, as mentioned above, are being constructed. Property has been acquired and plans of the site approved. Contracts for water and sewer systems have been awarded and the first inhabitants should start moving into the new towns later this year.

### Confidence Essential

"In closing," said Dr. Holden, "let me say that relations with our partner, the Power Authority of the State of New York, are on a mutual basis of the utmost confidence and respect. Close coordination has been maintained throughout with the several authorities concerned, including the International Joint Commission, the Joint Board of Engineers, the St. Lawrence River Control Board, the Seaway Development Corporation of the United States and Canada's St. Lawrence Seaway Authority.

"In a project such as this it is essential that all parties have confidence in the various constructing and supervising agencies. This confidence has been established and it is the aim of our partners and ourselves that it shall be maintained."

—by J. J. Kirkwood.



# ROBERT H. SAUNDERS MEMORIAL

UNIVERSITY Avenue, a broad and beautiful thoroughfare in the heart of Toronto, has been designated as the site of the Robert H. Saunders Memorial.

The Memorial Committee, under the chairmanship of A. Kingsley Graham, Q.C., Toronto, unanimously approved this location and a design generally in keeping with the sketch shown on this page. This decision was reached after very careful consideration of all the factors involved and consultation with Mrs. Saunders.

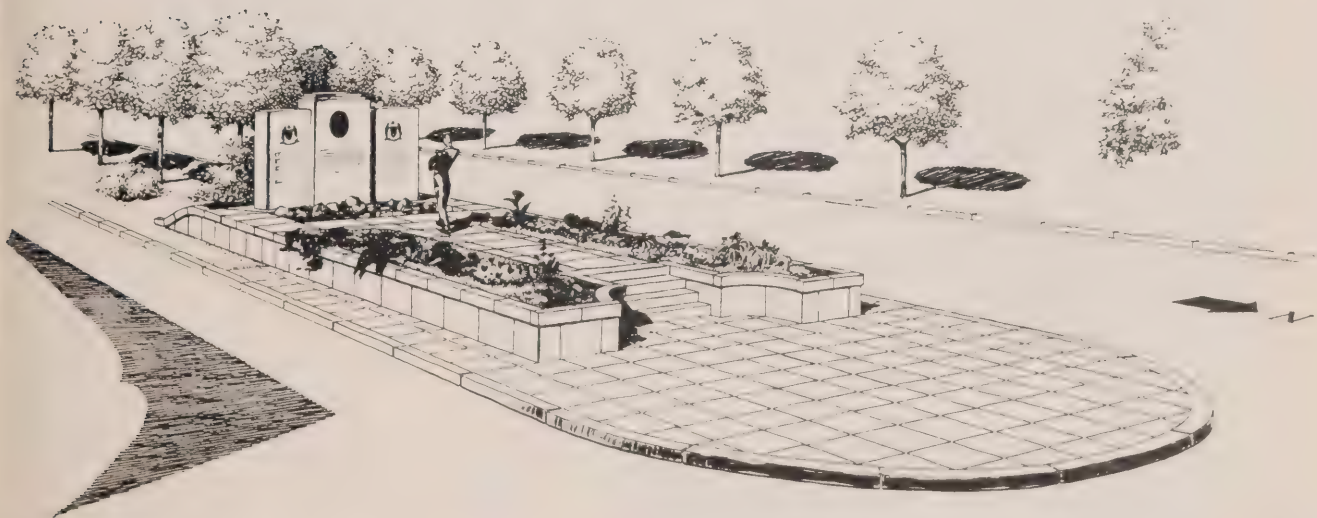
The memorial to the former Hydro Chairman will be located on the boulevard in the centre strip of University Avenue, immediately south of College Street. Facing Queen's Park, it will take the form of a central memorial panel, a small waterfall and pool, and a landscaped area with formal planting. This

impressive setting will be enhanced by floodlighting at night.

Construction of the memorial will be commenced as soon as practicable and will be carried out by the Commission's staff.

Significantly enough, Emmanuel Hahn, renowned Toronto sculptor, has been retained to execute the necessary sculpture work associated with the memorial and for general consultation. Mr. Hahn designed the statue in memory of the late Sir Adam Beck, first Ontario Hydro Chairman (1906-1925), which is also situated on the centre boulevard of University Avenue, immediately south of Queen Street.

Funds for the Robert H. Saunders Memorial were provided by subscription from friends and associates, various organizations, Hydro municipal utilities and Hydro employees. ■



ARCHITECT'S PERSPECTIVE OF THE ROBERT H. SAUNDERS MEMORIAL





D. P. CLIFF, O.M.E.A. Secretary-Treasurer

O.M.E.A. Secretary-Treasurer Reports on a Successful Year

# MANY HOPES REALIZED

**T**HAT the rapidly increasing demand for electrical power by all classes of customers in Ontario is creating a corresponding intensification of effort on their behalf by the municipal Hydro commissions and utilities is the considered opinion of D.P. Cliff, Secretary-Treasurer, Ontario Municipal Electric Association.

Mr. Cliff made this evident during the presentation of his annual report at the recent O.M.E.A.-A.M.E.U. Convention in Toronto.

Ten years of close association with the O.M.E.A. and a study of the history of the association, as recorded in the minutes over a period of 43 years, provide many convincing indications that never has so much business been finalized or so many hopes realized as in the past two years, he told delegates.

"For a number of years," he said, "it has been my privilege to attend meetings in all districts. It is quite apparent to me that there has been a resurgence of interest on the part of the district organizations. This has naturally been reflected in the aggressiveness of your Board of Directors, and I am confident that, with men of such calibre administering the affairs in the districts, we shall be able to go on to even greater accomplishments in the years to come."

This sharpened interest in electrical services, arising from customer demands, which derive their impulse from the striking growth and development of the province and the desire of the people for ever higher standards of living, is further indicated by the manner in which the various authorities concerned dealt with resolutions approved at last year's general meeting of the O.M.E.A.

The most important of these resolutions requested the Ontario Government to recognize the right of the municipalities to representation on The Hydro-Electric Power Commission of Ontario. This was favorably received and led to the almost immediate appointment to the Com-



mission of A. A. Kennedy, Owen Sound, President of the O.M.E.A. In making the appointment, Prime Minister L. M. Frost had stated: "I think the enlargement of this Commission and the recognition of the claims, which have been advanced for many years by the Ontario Municipal Electric Association is a step forward along the lines of broadening the Commission in a way which I think will be satisfactory, *particularly in view of the very great extent to which this Commission influences the economic life of this province.*"

As Mr. Cliff recorded results, it was apparent that the fate of most other resolutions carried last year was equally fortunate.

A resolution, requesting the Ontario Municipal Electric Association and the Association of Municipal Electrical Utilities to study the problem of consumer deposits, was dealt with immediately and a report submitted, which appeared from discussion to be approved in principle by most of the delegates. It will, however, receive further attention with respect to detailed planning, he said.

### Memorial Fund

A resolution requesting support for the Robert H. Saunders Memorial Fund and soliciting Ontario Hydro to levy up to two cents per kilowatt against the voluntary participating municipalities, received the endorsement of the Commission and the Accounting Department was authorized to comply with the wishes of the Association.

Another resolution seeking an amendment to the standard interpretation of rates, permitting a local utility to negotiate a "restricted power contract" for municipal arenas and ball parks, received favorable consideration from the Rates Committee of the A.M.E.U. and Ontario Hydro and the amendment is now in effect.

Reaffirmation of the desire of the Hydro municipalities for legislation, which will eliminate the necessity of specially processing street lighting

and other municipal utility power accounts, was embodied in a resolution, which has been acted upon by Ontario Hydro and a bill is now before the Legislature for its consideration.

A resolution requesting Ontario Hydro to consider any request by a local utility to develop unused water-power within the area operated by a local commission is now under consideration by Ontario Hydro.

In response to another resolution, Ontario Hydro agreed to inform the public of its liability with respect to the installation of T.V. antennae causing damage to electrical distribution systems.

"This year," Mr. Cliff reminded his audience, "we turn the final page of the first half century of recorded history of Ontario Hydro. Our first thought on this occasion is to express our profound gratitude to those, both past and present, whose fearless administration, honest endeavor and sound judgment have earned for our great organization

the admiration and respect of not only the citizens of our province, but also those in high places throughout the business world."

### Foresight Lauded

It is also a time, he said, to pay tribute to the foresight and wisdom of the Prime Ministers and other representatives of the Ontario Government holding office during the past half century. He singled out for special mention the Whitney Administration of 1906, which, he said, chose the side of the people, as represented by the municipalities of the province, enacting the legislation culminating in the formation of Ontario Hydro.

"Our association," Mr. Cliff declared, "can be justifiably proud of the part that the municipalities have played from the very beginning. In fact, had it not been for the group of municipalities, during the years 1903 to 1906 — led by E. W. B. Snider, D. B. Detweiler and Adam Beck — pressing for the right to

*(Continued on page 37)*



REGISTRATION FIGURES AT THIS YEAR'S CONVENTION SHOWED A TOTAL OF 874 DELEGATES.

# PROBLEMS OF

by Harry Hyde\*

(This article is based on a paper presented at the 1956 O.M.E.A. - A.M.E.U. annual convention and the annual meeting of District 4 O.M.E.A.)



HARRY HYDE  
Toronto

**T**HE GREATEST single factor which has influenced the electrical industry in the last five years has been the unprecedented load growth.

According to all the signs, the future holds the promise of even greater expansion of electrical systems. The technical press, for example, has indicated growth as high as 5 to 10 times in the next 25 years. Hydro Chairman Dr. Richard L. Hearn, in a recent address to the A.I.E.E. in Hamilton, indicated a fivefold growth of Ontario Hydro resources in the next 25 years. This expansion of generating capacity is based on a study assuming a load growth of 8.21 per cent a year between 1956-1960 and of 6.56 per cent a year between 1960 and 1980.

In discussing the impact of this growth on the distribution systems

of the future, one can perhaps best foretell what lies in store for distribution systems by reviewing past events. The writer, being more familiar with what has happened in the Toronto Hydro-Electric System, has used several examples to illustrate the steps taken to keep pace with the increasing demands made on that system.

Figure 1 on Page 33 shows the load growth in four Toronto suburban municipalities between 1947 and 1955. This phenomenal increase in loads is, of course, due primarily to the tremendous building boom and population growth in these municipalities, reflecting the consequent conversion of farm or rural areas into densely-populated residential districts.

## Load Density

This type of load growth could be referred to as area load growth—as distinguished from load growth in established areas, which is increase in load density.

\* (Mr. Hyde is Assistant Chief Engineer, Toronto Hydro-Electric System.)

An increase in load density is evident in the City of Toronto, where the population has been static and the area has not changed.

It will be noted in Figure 2 on Page 33 that the load has increased from approximately 350,000 kilowatts to about 525,000 kw. in the last six years — an increase of 175,000 kw. or 50 per cent. This represents an annual growth of approximately 7 per cent. At this rate, the Toronto load will double every 10 to 11 years.

Another type of load growth in Toronto, which is seldom mentioned, but which is equally important, is the increase in the load factor. Figure 3 on Page 34 shows an increase in Toronto's load factor from 63 per cent in 1937 to 74.5 per cent in 1955. Since November, 1955, the Toronto System has registered a load factor of 80.2 per cent.

These facts naturally focus attention on the steps which the Toronto System has taken to cope with this relatively small load growth of 50



# LOAD GROWTH

per cent. They also emphasize the importance of laying adequate and comprehensive plans for the future when loads are expected to double and quite possibly triple their present level.

Although most of the expansion has been undertaken in conjunction with the frequency standardization program, it is fully anticipated that all the facilities of the Toronto System being provided now will be operating at full capacity and additional facilities will be necessary by the time the changeover program is completed in 1959.

Figures 4 and 5 on Page 35 show a comparison for the years 1945 and 1956 in the number of terminal stations and the areas served by these stations.

Figures 6 and 7 on Page 36 show the number of 4 kv. substations in 1945 and the existing and proposed stations by 1959 (the year in which the frequency standardization program is scheduled for completion).

The shaded portions in these illustrations also indicate the growth in the size of the low-voltage network area during the same period.

## Distribution Transformers

In addition to increasing the station capacity as shown, the Toronto System also substantially increased the total distribution transformer capacity. This resulted in a reduction of the spacing between transformers, thus not only adding capacity, but taking care of the problem of additional voltage drop on existing lines due to the change-over to 60-cycle power. The additional distribution transformer capacity has also reduced the overload on the existing 25-cycle transformers now being operated at 60 cycles.

The following table, containing conservative figures, provides an illustration of the substantial increases Toronto Hydro has made in distribution transformer facilities over the past seven years:

	Transformer Capacity	(No power)
	4 K.V. House	4 K.V. Load
	Lighting Only	

1948	175,000 kva	200,000 kva
1950	190,000 kva	225,000 kva
1951	195,000 kva	245,000 kva
1953	280,000 kva	275,000 kva
1954	330,000 kva	290,000 kva
1955	343,000 kva	300,000 kva

This represents a load growth of approximately 6 per cent a year. On that basis, the 4 kv. load will double itself in 12 years.

To cope with the increased industrial load, it was decided to supply all power customers of over 500 kva. at 13.2 volts. This increased the number of consumers supplied at that voltage from 17 to 83 and the demand from 38,000 to 123,000 kva. These customers are served by underground feeders.

A low-voltage network in the Toronto downtown area made it possible to handle, without too much difficulty, the tremendous load increases in that area. However, due to the increased load density of the surrounding area, it was decided to expand the network and establish new small spot networks at growing commercial centres at St. Clair and

(Continued on page 34)

Load Growth in Four Toronto Suburban Municipalities (In Kilowatts)

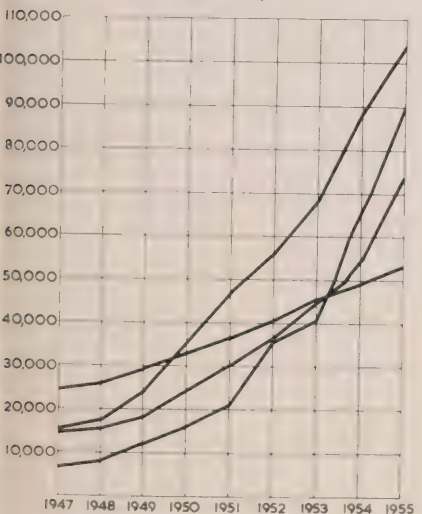


FIGURE 1

Toronto Hydro-Electric System Annual Net Peak Load (In Kilowatts)

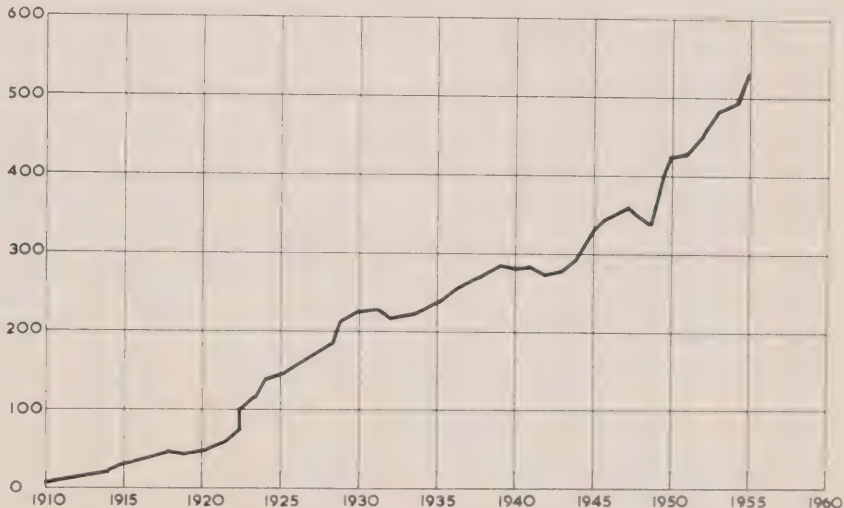


FIGURE 2

TORONTO HYDRO-ELECTRIC SYSTEM DAILY LOAD CURVES  
(In Kilowatts)

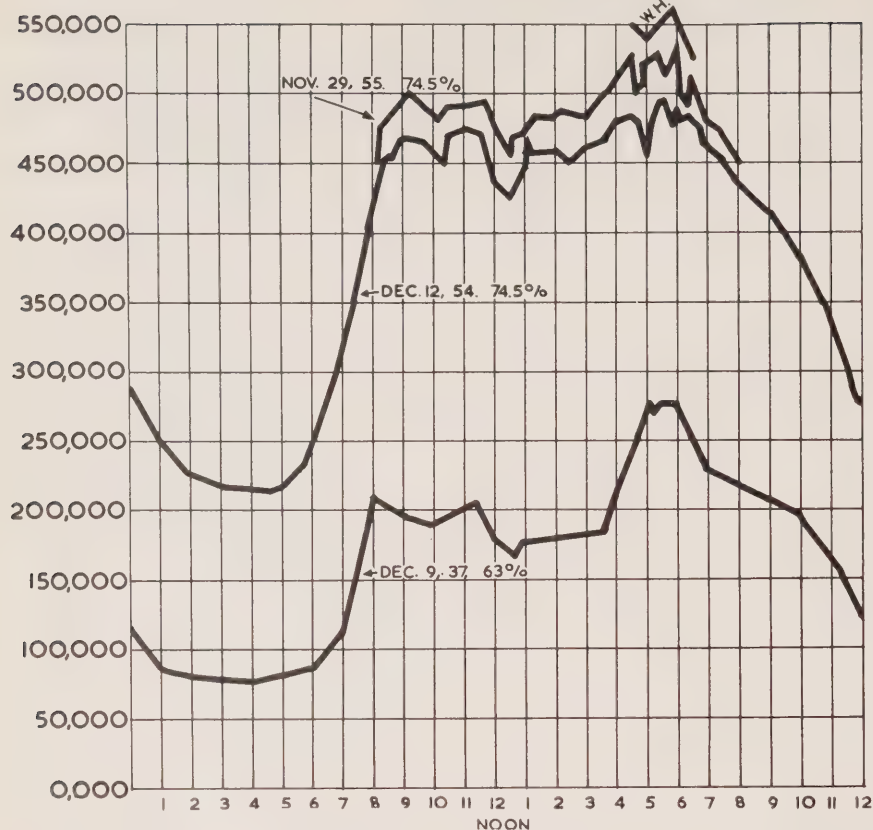


FIGURE 3

Yonge, as well as Eglinton and Yonge. It is expected that the loads on the various low-voltage networks will be approximately 125,000 kva. when changeover in these areas is complete.

The network transformers are usually located at the customer's service entrance and none of them more than 200 feet away. Thus, from 40 to 45 per cent of the load on the Toronto System will soon be handled at 13.2 kv. and all these feeders will be placed underground.

This discussion so far, has covered only the work necessary to add approximately 50 per cent capacity to the Toronto System. The big problem concerns the provisions necessary to cope with the twofold, threefold and possibly fivefold increases in the next 25 years.

Now it may be said that a sub-

stantial portion of the current load growth is due to industrial expansion, to new areas, to population growth and will not, therefore, result in too much congestion of distribution plant. That may be true as far as industrial expansion is concerned where higher voltage supplies, as indicated above, can remedy the situation. In urban commercial areas, the installation of a low-voltage network system can be of great benefit, but what of the residential areas? That seems to be the field where our greatest difficulties will be experienced. In considering this matter, it may be well to re-examine the record in Toronto, particularly the 4 kv. system, which supplies essentially residential areas.

As shown in the table on Page 33, Toronto, in 1950, had approximately 190,000 kva. in transformers

carrying approximately 225,000 kva. In 1955, the Toronto System had approximately 343,000 kva. in transformers carrying a load of 300,000 kva. This represents an annual increase of  $5\frac{1}{2}$  to 6 per cent per annum. At that rate, Toronto will be doubling the 4 kv. load every 12 to 14 years.

In considering the situation in Toronto, it is reasonable to anticipate that many other municipalities will become more or less established and, in that event, they will undoubtedly have to cope with similar problems.

Municipalities, where population increase has taken place, will soon have, not only the problem of geographical expansion, but will have to take care of the load growth in already established areas. In these areas they may have to look forward to load growth conditions, which will double the load every 12 to 14 years.

#### Load Components

For those at the distribution level, it is also important to know what makes up the load growth in residential areas.

Some years ago load growth meant an increase in the wattage of lamps, the addition of a few small appliances, the increase in the rating of a stove, the addition of a relatively low wattage water heater, etc.

Today's load growth is of an entirely different nature. It consists of a considerable amount of motor load and high wattage appliances. Consider the motor load of the average new residence, now add a few high wattage dryers, water heaters, etc. This type of new load growth cannot be handled in terms of the distribution systems that we know today. For one thing, some of these appliances have very high demands but very low kilowatt-hour consumption. Therefore, the amount of money that can be spent to supply these appliances at present rates is limited.

More and more of this type of appliance is being put on the mar-



ket. For example, *Electrical Engineering* for January, 1956, stated that:

- “1. Supplemental electric heating units complete with controls are being marketed and installed for use in conventional, domestic forced-air fuel-fired furnaces.
- “2. Experimental work is continuing on the use of small heat pumps in the 1½-2 hp. range to be used as a base heat source, with the cold peaks being taken care of by conventional heating sources.”

In addition, it should also be remembered that the saturation of standard appliances is increasing throughout Canada.

The air conditioning load is now an actual fact. Although it has just started in this part of the country, many utilities already have encountered numerous problems presented by this load.

How is this load growth going to affect distribution systems? Is this going to result in sharp peak conditions as indicated in the daily load factor curve for 1937, or is it going to be similar to that of the 1955 curve. The difference represents considerable revenue. Is it going to create a summer peak? Is it going to mean sharp peaks throughout the day, because of the high wattage appliances that require considerable increase in distribution plant for a relatively small increase in revenue?

The average residence with a stove now has a demand on peak of approximately 2.8 kilowatts, but with high wattage appliances this may go from 5 to 10 kw. The residential distribution plant must have a fairly high load factor in its own right. How will it be possible to fill in the valleys if high peaks and low load factors, created by these appliances, become prevalent? Will it be necessary because of the high peaks to find new loads to fill the valleys? How long can home heating be kept off distribution lines?

(Continued on page 36)

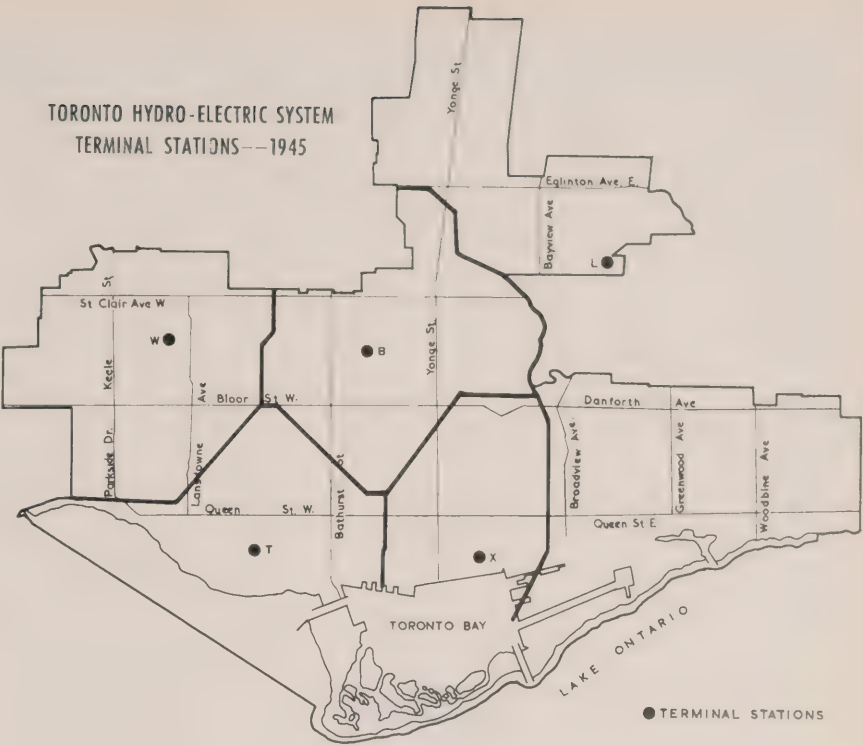


FIGURE 4



FIGURE 5

TORONTO HYDRO-ELECTRIC SYSTEM  
EXISTING 4-kv. STATIONS AND  
LOW VOLTAGE NETWORK AREA—1945



FIGURE 6

TORONTO HYDRO-ELECTRIC SYSTEM  
EXISTING AND PROPOSED 4-kv. STATIONS  
AND LOW VOLTAGE NETWORK AREA—1959

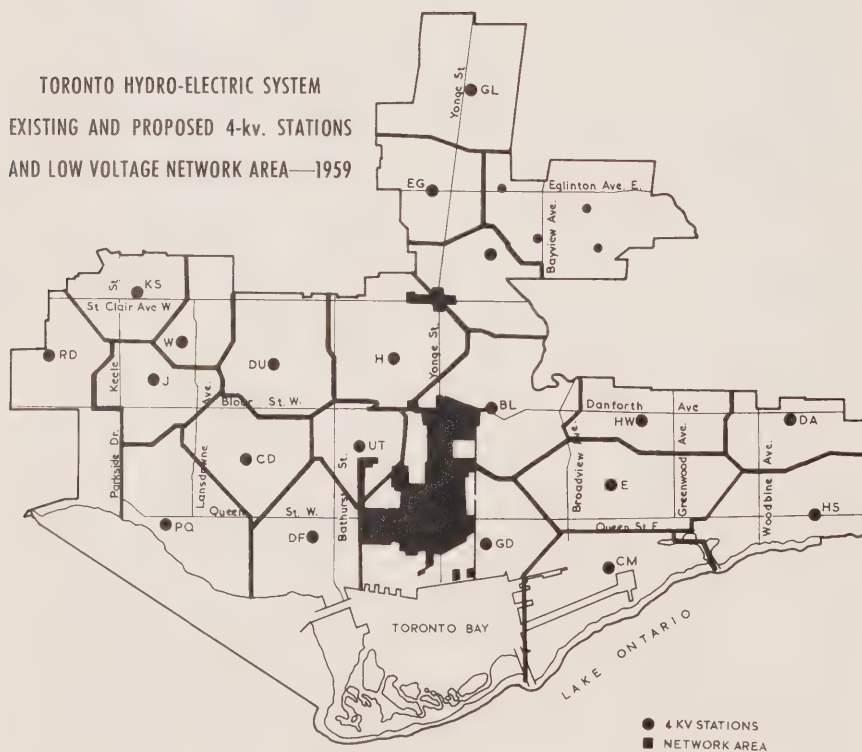


FIGURE 7

One way of coping with this situation would be, of course, to keep on putting in more distribution transformers, more primary lines, more substations until suddenly one day it is found that there are no more poles, no space for cross-arms to permit further expansion.

### Transformer Locations

In Toronto the average spacing in residential areas for transformers is somewhere between 500 and 700 feet, and many of the transformers are 37½ kva. with two transformers per pole.

In this connection, it is interesting to note the comments of Robert L. Wright, engineer of the Kansas City Power and Light Co. In an article, which appeared in *Electric Light and Power* (December 15, 1955), Mr. Wright describes the company's methods of converting its 4-kv. system to higher voltages. Dealing with the question of transformer spacing, the following paragraphs from this article are particularly significant:

"Present day residential load has outmoded 600-ft. secondaries; now our most common design is 240 ft. (two spans of 120 ft.). In extremely heavily loaded areas, this was reduced to one span. Some lengths of three spans are permitted in very lightly loaded areas.

"We have not yet come to using a transformer on every pole and eliminating the secondary. They may be justifiable in new areas, but in old areas advantage must be taken of the existing wire."

The economics of changing transformers to still larger ones is doubtful. In any event it will only solve the problem for 10 to 15 years. As higher load densities are experienced, losses become an ever-increasing consideration. This will become still more important as the Ontario Hydro System becomes more dependent on thermal generation, where, unlike hydro-electric generation, every kilowatthour of loss represents a quantity of fuel.

All this indicates that serious con-



sideration must be given to distribution methods radically different from those of the present. Higher primary distribution voltage is one of the answers and it has been used successfully by many utilities. However, this does not seem to be sufficient as it does not answer the problem of the secondary system and distribution transformers.

It appears possible that, having completed the frequency change-over, it will, perhaps, be necessary to launch into still another change-over program by adopting a higher utilization voltage to replace the present 120/240-volt system with a single-phase 240/480 or a three-phase, 240/416 or something along these lines.

The changeover to a higher primary voltage can be determined by a single municipality or preferably by a group of municipalities with reference only to their local conditions and the economics involved. However, the change to a higher utilization voltage is a problem, which involves, not only the municipality, but one might say the whole of the electrical industry of Canada. Before any move of that nature can be taken, the manufacturers must make that equipment available at a cost no greater than that of the existing equipment, the various inspection departments must rewrite existing rules or put new ones into the code that will permit the use of this higher voltage. No doubt other branches of the industry will be similarly involved.

Any change to a higher utilization voltage should be planned on a long-range basis. If, within the next 20 years, appliances are made for the dual voltage rating of 120 volts and 240 volts, it will be possible by means of a minor reconnection, to change an appliance or a small motor from 120 to 240-volt operation. In addition, if the wiring in new homes and the rewiring of existing homes is made adequate for this higher voltage, the problem of converting to a higher utilization

voltage 15 to 20 years hence, when load conditions warrant, such a change will be relatively simple. In some cases, where conditions do not warrant, no change in the voltage need be made.

A change of this type should be nationwide, but this should not stop members of the A.M.E.U. from sparking a move, which, to many, appears inevitable.

An A.M.E.U. committee is being appointed to study the effect of load growth and will no doubt deal with this most important topic. It is quite possible that the work of this committee will result in a similar Canadian committee being established. In the meantime, the work of a major segment of the Canadian electrical industry, such as the A.M.E.U. represents, will undoubtedly add considerable impetus to this tremendous task.

It is important to remember that 25 years is a relatively short period of time. If distribution systems are to be ready for what lies ahead, consideration of these problems must start now. ■

## MANY HOPES REALIZED

*(Continued from page 31)*

generate and distribute electric power as a public utility, it is doubtful if Ontario Hydro, as we know it today, would ever have come into being."

The Secretary reported an increase in membership in the O.M.E.A. over the previous year. Of the 343 municipal electrical utilities associated with Hydro, 288 held membership last year, an increase of 7 members over 1954. Up to the present time this year, 10 new members have joined. During its 43 years' existence, the O.M.E.A. has never, in any year, failed to add to its membership.

Five meetings of the Board of Directors have been held since the last annual meeting, as well as one meeting of the district presidents and secretaries. In addition, the board made a tour of the St. Lawrence Power Development.

The financial position of the association continued to be strong, there being slightly over one year's revenue in reserve. This was considered to be normal. The auditor's report shows assets, in cash and bonds, to the value of \$12,394.81—\$927.38 of which was held in trust for further expense in connection with the preparation and distribution of the A.M.E.U. "Guide to Municipal Standard Construction" manuals. Ordinary expenditure during the year was \$1,066.06 in excess of ordinary revenue.

"On May 14," Mr. Cliff pointed out, "we will begin to write history on the first page of the next half century of service to the people of Ontario. Plans of your Board of Directors call for a celebration at Kitchener on that date. It is my sincere hope that your attendance and support of this function will be such as to be a credit to those early pioneers whose efforts and sacrifice made it possible for the citizens of this province to enjoy the highest standard of electrical living in the world. Your cooperation and active participation in this venture will assure that what is written on the first page of our second volume will be worthy of the best traditions of the past."

In conclusion, the Secretary referred to the demise of Warren P. Bolton, Windsor, and Jack R. Pattison, Fort William, who had been "called to their great reward" while holding office as board members. They served the association with distinction for many years, he said. —By H. M. Blake.



# CONTRIBUTION TO

CONTINUING a tradition established in 1954, the Ontario Municipal Electric Association honored 46 veteran members at the annual convention in Toronto this year.

Representing 41 different Ontario municipalities, these guests of honor received enthusiastic applause from the large audience as they were escorted by a kilted piper into the banquet hall, where they were given special seats at the "first head table." The banner carried at the head of the triumphal parade signified that their combined service records totalled 807 years.

Again, as in previous years, Hydro Vice-Chairman W. Ross Strike, O.M.E.A. Past President and a member of Bowmanville Public Utilities Commission for 22 years, was accorded the privilege of formally presenting certificates to the long-service municipal Hydro and public utilities commissioners.

Assisted by O.M.E.A. Secretary-Treasurer D. P. Cliff, Mr. Strike presented framed illuminated scrolls, indicating the "grateful recognition of their contribution to the progress of the municipal Hydro systems" and citing their "loyalty to the ideals of our province-wide, publicly-owned hydro-electric systems," to commissioners with 15 years or more service in their individual municipalities.

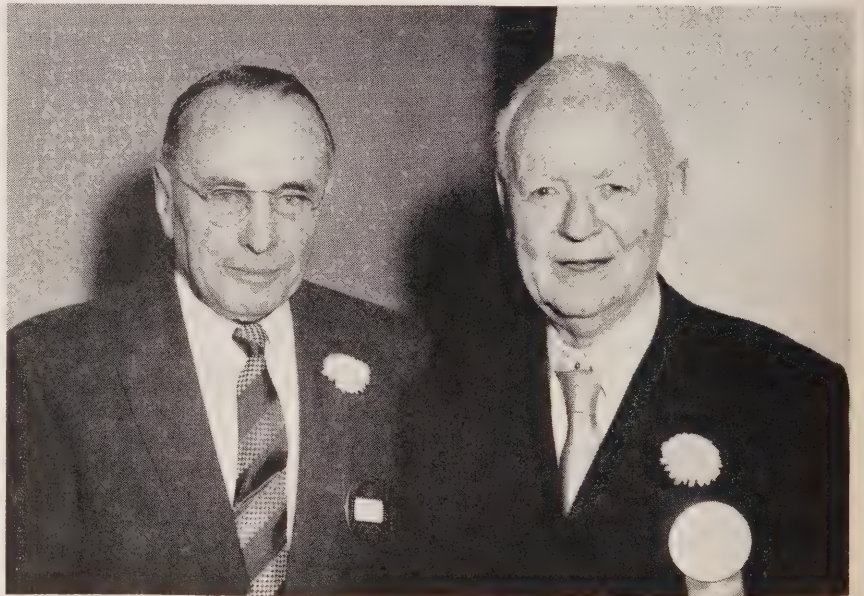
Notable in the group receiving this year's awards was F. E. Welker, of St. Jacobs, who was honored for 39 years' service.

With 23 years' service to his credit, S. T. McCann, Westport, also received a certificate.

*(Continued on page 40)*



FLANKED by Dr. M. P. Benger, left, and Sam Ashton, Port Arthur P.U.C. members for 16 and 18 years respectively, William Booker was honored for 16 years' service to Meaford P.U.C.



TWO well-known Hydro representatives from the Georgian Bay area, left to right: W. E. Theaker, Paisley, 15 years, and H. G. Robertson, Barrie, 18, were presented with certificates.



# PROGRESS



△  
TWO fellow-commissioners from Preston, W. B. Denyes, left, and O. J. Little both received 16-year scrolls.



△  
A COMELY hotel employee assisted H. E. Sinclair to carry the banner. Flanking them, front row, left to right: H. R. Henderson, Woodstock; P. R. Locke, St. Thomas; Sam Ashton, Port Arthur, and R. C. Fenner, Riverside.

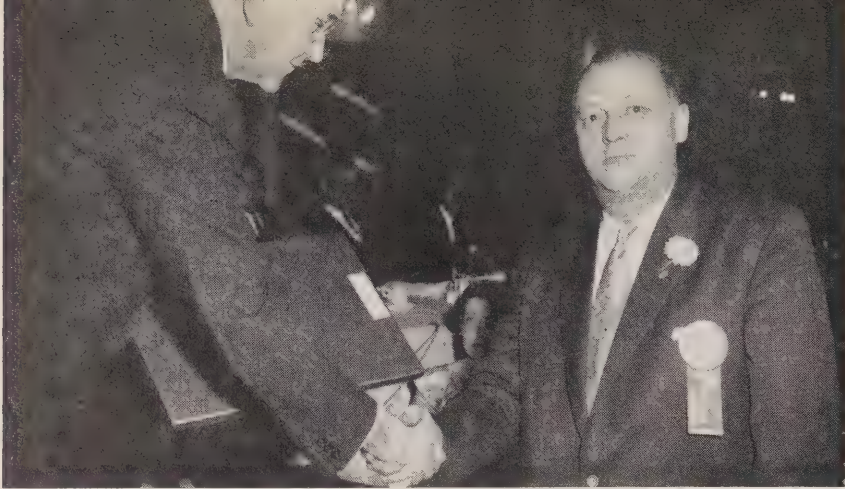


△  
P. R. LOCKE, St. Thomas, left, with 19 years' service, and W. T. Merrett, West Lorne, also 19, were honored.



△  
T. H. RUPERT, left, who has served Madoc H.E.C. for 17 years, receives congratulations from E. H. Matthews, an 18-year Hydro veteran from Forest.





△  
H. B. LOFQUIST, right, Oakville P.U.C. Chairman, who was Chairman of the town's Water and Light Commission when it joined the Hydro family in 1949, received a 16-year certificate.



△  
W. ROSS STRIKE congratulates V. C. Johnson, left, on 20 years' service at Streetsville.

Preceding by a few hours, his election as O.M.E.A. President, Gordon H. Fuller, Windsor, was presented with a 15-year parchment.

Orangeville sent two representatives of its Hydro commission: W. J. Gillespie and James Henderson, with 15 and 19 years respectively, to receive their awards, while two Mimico commissioners, A. H. Waites and James Edmond, both with 16-year records, were honored. Representing Port Arthur Public Utilities Commission were Sam Ashton, a 19-year veteran, and Dr. M. P. Benger, who has served that utility for 16 years.

Active in O.M.E.A. circles for many years, E. V. Dyke, Smiths Falls, received a scroll in recognition of 16 years' service, while a fellow-commissioner from Smiths Falls, F. A. Wale, received a 15-year award.

Another municipal, long-service "team" honored during the ceremony were: W. B. Denyes and O. J. Little, both of whom have served as Preston commissioners for the past 16 years.

Also the recipients of hearty congratulations were:

W. J. Abell, Brampton, 17 years; J. G. Baldwin, Lindsay, 19; John T. Barnes, Sarnia, 17; Thos. Barnes, Niagara Falls, 18; Fred Barraclough,

*(Continued on page 42)*



△  
REPRESENTING combined municipal service of 69 years, left to right: E. V. Dyke, Smiths Falls, 16 years; J. G. Baldwin, Lindsay, 19; James Edmond, Mimico, 16, and M. J. Elliott, Bowmanville, 18, were among the 46 veterans from various municipalities honored this year.



△  
C. B. JOHNSTON, commissioner at Essex for 15 years, left, was found reminiscing with Alex. Campbell, 17-year Embro veteran, and H. E. Sinclair, 20-year Carleton Place commissioner.





△  
FRED HILLS was honored for 16 years' service with Peterborough Utilities Commission.



△  
ACTIVE in O.M.E.A. circles, John T. Barnes, Sarnia, was honored with 17-year certificate.



△  
ELECTED O.M.E.A. President, Gordon H. Fuller, Windsor, received a 15-year scroll.



△  
AN ACTIVE member of District 7 O.M.E.A., H. R. Henderson smilingly accepts a certificate signifying 15 years' service with Woodstock P.U.C.



△  
TORONTO Township Commissioner for 15 years, G. D. Pattison, right, is presented with his long-service award.



△  
PROUD of their matching 16-year records as Mimico commissioners, A. H. Waites, left, and James Edmond are presented with their parchments.



PLEASED with their combined service record of more than a half-century, left to right: Dr. V. S. Wilson, Etobicoke Township, 20 years; F. A. Fitzgerald, Petrolia, 21, and R. C. Fenner, Riverside, 18, formed a jovial trio as they were presented with the O.M.E.A. long-service awards.

Beamsville, 18; Wm. Boddy, Oshawa, 20; Wm. Booker, Meaford, 16; Alex Campbell, Embro, 17; M. J. Elliott, Bowmanville, 18; Robt. C. Fenner, Riverside, 18; F. A. Fitzgerald, Petrolia, 21; H. P. Frid, B. A.Sc., Hamilton, 20; H. R. Henderson, Woodstock, 15; Fred Hills, Peterborough, 16; V. C. Johnson, Streetsville, 20; C. B. Johnston, Essex, 15; Cecil Jones, Omemee, 15; G. L. Klager, Fonthill, 16; H. E. Lankin, Lucan, 18; Stanley Lewis, O.B.E., LL.D., Ottawa, 19; P. R. Locke, St. Thomas, 19; H. B. Lofquist, Oakville, 16; E. H. Matthews, Forest, 18; W. T. Merrett, West Lorne, 19; G. D. Pattison, Toronto Township, 15; H. G. Robertson, Barrie, 18; Thos. H. Rupert, Madoc, 17; Wm. A. Shaw, Warkworth, 19; H. E. Sinclair, Carleton Place, 20; J. H. Summerfeldt, Cannington, 20; W. E. Theaker, Paisley, 15; F. R. Watson, Thamesville, 15; Dr. V. S. Wilson, Etobicoke Township, 20. ■



EQUALLY proud of their long period of utility service were, left to right: James Henderson, Orangeville, 19 years; Frank Watson, Thamesville, 15, and Thomas Barnes, Niagara Falls, 18.

PROMINENT in Ottawa civic circles for many years, Stanley Lewis, O.B.E., LL.D., was honored by an award for 19 years' service.





# LOAD GROWTH AND NEW APPLIANCES

**P**ossible formation of a Load Study Committee was predicted by Norman A. Grandfield, Brantford, Chairman, A.M.E.U. Standards Co-ordinating Committee, in presenting this committee's report during the recent O.M.E.A.-A.M.E.U. annual convention.

Addressing a joint session of both organizations, Mr. Grandfield reported that a request had been received to develop a method of studying municipal loads for the purpose of providing information to the municipalities on the possible effect of new types of domestic appliances.

Reviewing the history of the Standards Co-ordinating Committee, Mr. Grandfield said it was formed in 1950 to develop a guide to provide information for municipal systems on approved methods of construction and planning of all sections of municipal distribution systems in order to obtain a reasonably high degree of uniformity among Ontario municipalities.

Pointing out that the guide was divided into three sections under the headings of Overhead Construction and Maintenance, Stations and System Planning, and Underground Construction, the speaker said that the first two of these sections were completed and adopted by the A.M.E.U. at the 1955 summer meeting. These two sections were issued to the municipalities in the form of a first draft, which would require revisions and amendments. The Underground System guide will be presented at the 1956 summer meeting. It will also be issued in temporary binders until the final guide, containing all three sections, is reissued in printed form. At that time, all three sections will be contained in one binder.

Referring to the generous contributions made by several representatives of the A.M.E.U. and Ontario Hydro to the work of the committee and the preparation of the publication, and to the assistance of the O.M.E.A. in the initial financing of the publication of the guide, Mr. Grandfield paid special tribute to C. S. Phelps, Sarnia; J. D. Sutherland, Hamilton; A. L. Furanna, London; G. L. Lillie and Harry Hyde, Toronto; M. J. McHenry and D. J. Gordon, Ontario Hydro, and W. R. Mathieson, Secretary of the Committee.

—by Frank Wood.

## JUBILEE CELEBRATION

**M**AY 14 is an important date in the calendar of events being planned to celebrate the Hydro Golden Jubilee this year. Commemorating the historic act, passed by the Ontario Legislature, which was given Royal assent on May 14, 1906, enabling the formation of The Hydro-Electric Power Commission of Ontario, a cairn honoring the memory of the late E. W. B. Snider will be unveiled at St. Jacobs, Ontario, at an afternoon ceremony this year. Mr. Snider, one of the first advocates of a publicly-owned electrical system in Ontario, was a prominent figure in the steps leading to the formation of the Commission.

Jointly sponsored by the O.M.E.A., A.M.E.U., Kitchener Public Utilities Commission and Ontario Hydro, the St. Jacobs ceremony will be followed by a monster dinner and entertainment program at the Kitchener Memorial Auditorium. Kitchener (then Berlin) was the first municipality in the province to receive power from the infant Ontario Hydro, this new electrical service being officially inaugurated at a gala ceremony on October 11, 1910.



GEORGE W. GRABB  
Chesley



E. R. WILKINSON  
Bolton



FRED YORK  
Ottawa



# "THE CHALLENGE OF A MEMORY"



DR. MARCUS LONG  
University of Toronto

ONE of the highlights of this year's annual O.M.E.A.-A.M.E.U. convention was the address delivered at the luncheon on Tuesday by Dr. Marcus Long, Associate Professor of Philosophy at the University of Toronto. Choosing as the title of his address "The Challenge of a Memory," Professor Long provided his audience with a memorable and thought-provoking examination of the social implications of Hydro in Ontario.

Referring to the "well-established principle of democracy" that a natural monopoly or a service basic to the health and general welfare of society is usually better under public than private ownership, Dr. Long paid a glowing tribute to his audience with the declaration that "your handling of Hydro provides strong support for that policy."

That science and engineering have been the major forces shaping modern civilization can hardly be denied, Dr. Long stated. "The harnessing of steam, the invention of the internal combustion engine and the electric generator are scientific achievements, which have profoundly altered the pattern of our culture and transformed the living and working habits of our society," he stated.

During the past 50 years, under the guidance of organizations like Hydro, electricity has come to be taken for granted and electrical appliances are now an essential part of almost every home. Eliminating most of the drudgery from the work of the housewife, electricity has also given radio and television to the human race. These new communication devices have added new and,

at times, disturbing dimensions to the knowledge of the modern world.

To those who view the influence of television with alarm, Professor Long pointed out that man has a remarkable capacity for adjusting to new circumstances.

"Perhaps our greatest fear," he commented, "should be directed towards those who are most vocal in their fear about its influence, since such people may, because of their anxiety to protect us, seek to impose such a censorship on the new media we shall not be allowed to hear the exciting, the provocative, the controversial or the mature."

In any case, those who are working with electricity are helping to shape the pattern of a new society and this imposes on them a responsibility for helping to guide society in the proper use of the new machines.

## Grave Responsibilities

With regard to the role of Canada in a world of accelerated change, Dr. Long asserted that the accumulation of wealth and the achievement of independence over the past 50 years have imposed grave responsibilities on Canadians, of which is their obligation to share skills with the peoples of the world's underdeveloped countries.

"Particularly, we must share with them," he said, "our knowledge of electricity as the key to the establishment of an adequate industrial economy and national prosperity that we hope will keep them on the side of freedom."

Looking to the future, the speaker predicted that electricity would play an even greater role in the transformation of the world in the years to come than it has played in the past 50 years. Today, humanity faces the era of automation, an economic and social revolution made



possible by electricity. And although no one can foretell what will happen, it is hoped that men will apply to their social, moral and political problems the same intelligence that has made electric power the servant and benefactor of mankind. Adjustment to the vastly altered social conditions brought about by automation will not be achieved without great effort. But because mankind has learned that there are no problems in Nature beyond solution, men know that they can be defeated only when they lose faith and defeat themselves.

### Sacred Trust

To the men of the future, Dr. Long said, "we, of today, hand over a sacred trust in the right to produce and distribute electrical power under a system of public ownership." Although it is necessary and desirable, in a democratic society, that Hydro should be scrutinized occasionally by the elected representatives of the people, there must, nevertheless, be a limit to political interference just as there must be a recognition that Hydro must be kept free from those who would use it for personal aggrandisement. Should anyone in future be guilty of either of these infringements upon the operation of this great public enterprise, he will have destroyed the exciting dream of Hydro's pioneers, who fought so hard to make it a reality. In celebrating the 50th anniversary of Hydro, it should be remembered that Ontario citizens can most faithfully honor the memory of the great men, who dedicated themselves to a vision of a people made prosperous and comfortable by the gifts of nature, by carrying on their vision, by retaining their spirit and by helping to realize, to an even greater extent, the fullness of their dream.

With the example of these early pioneers and their inspiring vision as a legacy for the generations of the future, Dr. Long urged all associated with Hydro to dedicate

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# Requiem



LIGHTS were turned off on walls and ceiling. The assembly room at the Royal York Hotel, where delegates to the O.M.E.A. - A.M.E.U. Convention were in session, was plunged in darkness — save for a single lamp, which shed a soft radiance on an open Bible resting on a pedestal draped in black.

It was eleven a.m. — the traditional Armistice Day hour of remembrance for those who gave their lives in two great world wars. This was February 27, however, and the men who were standing at silent attention in the darkened room were paying tribute to comrades who had died, under less heroic circumstances, perhaps, but nevertheless, while serving their communities. They were the Hydro municipal commissioners; and many of them had been working at their accustomed tasks, planning even better electrical services for the people of Ontario, when they had been called away. Like the soldiers honored on November 11, they had left this "bourne of time and space," passing the torch of loyal service and endeavor to the men who were to follow in their footsteps.

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themselves afresh to "the challenge of a memory."

"There can be no greater satisfaction to any man," he concluded, "than to feel he is a vital part of a great organization bringing immeasurable benefit to the people. That is your happy lot. I congratu-

The brief ceremony honored the memory of 17 deceased commissioners, 15 having passed away during 1955. They were: Melvin T. Bradley, Lucan; James Carmichael, Kemptville; George T. Trowhill, Etobicoke; Dr. C. Elsworth Gibson, Elmira; Ivan A. Shantz, Kitchener; Richard M. Durnford, Toronto; Fred B. Pense, Kingston; George W. Gordon, Kitchener; William R. Little, Brussels; George Henderson, La Salle; John Gagnon, Delhi; Oran Westell, Kincardine; Gordon Stanley, Ripley; Noble E. Hurdle, Newbury, and Warren P. Bolton, Windsor. William G. Parke, Hensall, and John R. Pattison, Fort William, died in January this year.

As A. A. Kennedy, President of the O.M.E.A., who represents the association as an Ontario Hydro Commissioner, called each name, the Secretary, D. P. Cliff, placed a crimson rose upon the open Bible. The flowers were in full bloom and fragrance, symbolic of perfect service, while the vividly green stalks, laid across the saving words of Holy Writ, seemed to stress the promise of Life Eternal. ■

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late you, therefore, on the 50th anniversary of a dream in which you share, a dream which has made the dreamers an immortal part of Ontario history and Hydro the most vital part of our economy."

—by W. T. Delworth.

# COOPERATIVE ENTERPRISE

## Delegates Endorse Committee Reports

**T**HAT Hydro is a cooperative enterprise in the fullest meaning of the word was again emphasized during the reception of reports at the recent session of the annual convention of the Ontario Municipal Electric Association in Toronto, with A. A. Kennedy, President of the Association and now representing it on the Ontario Hydro Commission, presiding.

The cooperation recorded on this occasion dates back to 1944, when the Commission, reporting to the Ontario Legislature respecting differences in the cost of power supplied to municipalities, stated that it had recommended to the cost contract municipalities that they be charged a small amount in the cost of power to be applied in bringing down the maximum cost per horsepower in certain exceptional cases. On March 15, 1944, the Ontario Municipal Electric Association adopted the following resolution: "While adhering to the basic principle of the supply of power at cost, the Ontario Municipal Electric

Association recommend to the co-operating municipalities, which comprise its membership, that they agree to a voluntary levy of not more than five cents per horsepower on their municipal load in order to reduce the price to those municipalities whose power costs are excessive and that this fund be used to reduce the price of power to these municipalities to not less than \$39 per horsepower."

In accordance with this resolution, Ontario Hydro, for the fiscal year, 1944, reduced to \$39 per horsepower the wholesale cost of power to a number of small cost municipalities whose cost, in accord-

ance with their contract, would have exceeded this maximum.

The fund created by this voluntary levy is known as the "Maximum Cost Reserve Fund." By 1954, this "Big Brother grant-in-aid" had reached such proportions that it was apparent that no further contributions would be required and the O.M.E.A. suggested that the interest from this reserve be used to establish a ceiling rate to cost municipalities.

Last year, according to the report of the "Maximum Reserve Fund" Committee presented to the O.M.E.A. convention by the Chairman, Stanley G. Thompson, Chatham, 22 municipalities benefitted from the application of the interest by reductions in their cost of power.

In seconding the motion for adoption of this report, W. P. Dale, Brampton, stressed the spirit of co-operation, which prevailed among the municipalities in dealing with one another as well as with Ontario Hydro. He also praised the work that had been accomplished by Mr. Thompson and his associates on the committee — W. J. Cross, Hanover, and Gordon Fraser, Parkhill.

## Finance Committee

The report of the Finance Committee, composed of E. R. Freeman,

DELEGATES applauded the announcement that 22 Hydro municipalities, during 1955, received reductions in their cost of power by the application of interest from the "Maximum Cost Reserve Fund" established in 1944.





Port Arthur, Chairman; Dr. R. A. Patterson, Kemptville, and C. R. Buss, Thorold, showed that the association's expenditures during 1955 exceeded revenue by \$1,000. This was attributed largely to the expenses involved by managers of different utilities visiting one another's districts to discuss problems of customer service. It was explained by D. P. Cliff, O.M.E.A. Secretary, that this was a "follow-up" on a plan decided upon at a meeting of the Board of Directors, which is now developing a questionnaire to assist this new scheme of municipal cooperation. It was pointed out that the O.M.E.A. has a reserve in cash and bonds of \$12,394.81 — the equivalent of a full year's revenue so that the expenditures involved in carrying out this additional service in the interest of municipal customers can readily be met.

Dr. Patterson moved the adoption of the report, which was seconded by C. J. Halliday, Chesley, and approved unanimously.

The Convention financial statement was presented by W. E. Wright, Port Credit, Chairman of the committee, whose other members were Dr. V. S. Wilson, Etobicoke Township and Bert Merson, Toronto. A credit of \$1,418.63 was recorded on the Convention account. The report was endorsed without discussion.

#### Long-Service Committee

The Long-Service Committee's report was presented by Thomas Barnes, Niagara Falls. Associated with him as committee members were Gordon Fraser, Parkhill, and W. J. Cross, Hanover. The report recorded the decision reached to present each municipal Hydro commissioner with a certificate on attaining his 15th year of service. On

retirement a new certificate will be forwarded to each commissioner, recording the exact number of years he has served his municipality. This method of recognition, which, after many years of debate, definitely fixes the minimum service required for the coveted award, was unanimously approved.

For some time past, the O.M.E.A. has been considering the formation of a mutual benefit fire insurance organization. Progress in the development of this plan was recorded in the report presented by G. H. Glover, St. Marys, in the absence of the Committee Chairman, H. O. Hawke, Galt. J. R. Pattison, who died in January this year, was the other member.

The Committee had been entrusted with the task of making a survey of the Hydro municipalities across the province with regard to fire losses and the cost of protection. A detailed survey has been made in District No. 6 and Mr. Glover claimed that evidence is steadily building up to support the scheme whereby the O.M.E.A. would create its own facilities for fire insurance insofar as the properties of the participating Hydro municipalities are concerned.

On a motion for adoption, seconded by Thomas Barnes, Niagara Falls, the report was approved.

A special committee comprised of W. B. Elliott, St. Catharines, Chairman; Thomas Barnes, Niagara Falls, and C. R. Buss, Thorold, reported on consumer deposits. Progress was recorded in the evolution of a plan, which would protect the Hydro municipalities from losses and at the same time operate with equal fairness to all customers concerned. On the motion of Mr. Elliott, seconded by Caspar W. Fleet, Baden, the report was adopted.

—by H. M. Blake.



## VISION OF THE FUTURE

**"W**HERE in the world would big, prosperous Ontario be without cheap power?"

That was the query raised by John Fisher, noted Canadian raconteur and radio commentator, in addressing delegates at this year's O.M.E.A.-A.M.E.U. convention.

He answered the question in his own customary dramatic fashion by alluding to the indispensable role of electricity in the development of the province's pulp and paper resources, its widespread mineral wealth and its industrial enterprise in the southern section of the province.

"We are known around the world as the power province — and well-administered, too," the speaker observed.

#### Remarkable Progress

Turning to the future, Mr. Fisher predicted even more remarkable progress in transmitting and utilizing electrical energy.

By the time 1980 comes, Ontario Hydro will have spent almost seven billions in capital to satisfy demands five and six times what they are today.

Mr. Fisher also envisaged the possibility of draining the muskeg of northern Ontario with cheap power from atomic energy, extending farm land and forest land "and then affecting the climate of the north."

"It is quite possible that oranges will grow in Sudbury and even farther north," he declared.

Dealing also with new trends in transportation, the speaker foresaw the possibility that Lake Ontario might, within the next half-century, have a rival in James Bay. Thus, Ontario will have "an important back door to the Atlantic Ocean" and the trip to Moosonee will take no longer than to Hamilton today."

## PERMANENT SERVICE

### PROBLEM SOLVED

**A** DEFINITION, drawn up by the Municipal Hydro - Electric Pension and Insurance Committee, has finally solved the problem of determining what constitutes "permanent service."

Chairman Percy R. Locke, reporting to the O.M.E.A.-A.M.E.U. general meeting, said there has been misunderstanding as to what constitutes "permanent service" for pension contract purposes since the pension and insurance plan was inaugurated in 1929. As a result, some commissions added new employees after three months' service, others delayed up to two years, while in some instances new employees were overlooked entirely. For the purposes of protection of all employees and uniform administration of the pension plan, municipal employees, whose employment continues for a period in excess of six months on work which is not of a casual or seasonal nature, are deemed to be permanent.

"This definition is now operative," Mr. Locke pointed out "and commissions within the plan are requested to check their payrolls and enter immediately all employees who are affected."

Consideration is being given to the question of employees who, because of their age when their commissions entered the plan, are entitled to comparatively small pensions or none at all. It is hoped that joint study of this problem by commissions, staffs and the Pensions Committee will result in a solution for dealing more adequately with this type of employee.

Mr. Locke reported that many commissions are retaining such employees on full pay after their efficiency has become impaired, thus retarding the progress and

affecting the morale of younger employees, as well as imposing on the commissions a very costly form of pension.

Referring to communities, which change from rural operation and establish local commissions, or when there is expansion within existing systems, Mr. Locke pointed out there is bound to be a certain amount of recruitment of Ontario Hydro trained personnel in forming municipal staffs. In some cases personnel transfer to Ontario Hydro. It is felt, therefore, that it would be of great advantage to Hydro operations generally if some form of transfer of benefits as between the Ontario Hydro Pension Plan and the municipal plan could be worked out. Study in this direction is to be undertaken.

Telling the delegates that 571 employees are making "extra voluntary contributions" to increase the value of their ultimate pensions, Mr. Locke stated that these voluntary contributions are also deductible for income tax purposes and now total well over \$10,000 monthly.

Growth of the plan into a unit of considerable size is revealed by the following table: Municipalities included — 134; Municipalities included in supplementary plan — 42; Employees included — 5,885; Life Insurance Benefit in force — \$24,679,630; Employees at present drawing pension — 456; Death claims to December 31, 1955 (Life Insurance) — 722; Amount of death claims to December 31, 1955 (Life Insurance) — \$2,173,600; Amount of employees' income annuity contributions refunded — \$686,416.

Stressing that the plan constitutes an assurance of security and welfare for many people, Mr. Locke said his committee is anxious to have its benefits made available to

## ASSOCIATIONS ELECT OFFICERS

*(Continued from page 21)*

arines; T. J. Moffat, Listowell; J. S. Killingsworth, London, and John T. Barnes, Sarnia.

District Directors for 1956 are: Dr. R. A. Patterson, Kemptville, and H. S. Graham, Newcastle, representing District 1; A. A. Kennedy, Owen Sound, and Wm. J. Cross, Hanover, District 2; Dr. M. P. Benger, Port Arthur, and George O'Neill, Nipigon, District 3; Dr. V. S. Wilson, Etobicoke and A. H. Waites, Mimico, District 4; C. R. Buss, Thorold, and Roy Pierson, Brantford Twp., District 5; G. H. Glover, St. Marys, and H. O. Hawke, Galt, District 6; H. R. Henderson, Woodstock, and P. R. Locke, St. Thomas, District 7; T. A. Cada, St. Clair Beach, and Roy Warwick, Blenheim, District 8. D. P. Cliff, Dundas, is Secretary-Treasurer.

### A.M.E.U. Officers

G. R. Davis, Kingston, was named Vice-President of the A.M.E.U. Directors-at-large are: W. J. Wylie, Toronto; John Torrance, Toronto, and S. G. Murchie, Brantford Township.

District Directors are: Eastern, J. H. Page, Renfrew; East Central, C. B. Campbell, Trenton; Georgian Bay, S. R. Walkinshaw, Orillia; Niagara, Ray Pfaff, St. Catharines; Northeastern, B. M. Graham, North Bay; Northwestern, E. A. Vigars, Port Arthur; Toronto, Harry Hyde, Toronto; West Central, H. B. Mattson, Preston; Western, C. S. Phelps, Sarnia.

Secretary-Treasurer is W. R. Mathieson, Toronto. ■

all the employees of every municipal Hydro or public utility commission in the province, intimating that committee representatives are ready, at any time, to submit cost quotations or discuss with commissions or their employees the operation of the plan. —by Frank C. Wood.



# Convention Caricatures



NORMAN GRANDFIELD  
Brantford

BY *W.F. Mac*  
TORONTO TELEGRAM CARICATURIST



H. E. SINCLAIR  
Carleton Place



C. L. LEACH  
Chatham



ELMO CURTIS  
London



MAYOR M. E. DICKERSON  
North Bay



FRED DIXON  
Guelph



WALTER BEALL  
Renfrew



J. F. WALSH  
Niagara-on-the-Lake



50 YEARS OF PROGRESS



ONTARIO HYDRO  
*News*  
MAY, 1956



Power Parade

# ONTARIO HYDRO

PUBLISHED BY THE HYDRO-ELECTRIC  
POWER COMMISSION OF ONTARIO  
620 UNIVERSITY AVENUE, TORONTO



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## THE CHALLENGE OF CANADA

SIR Wilfrid Laurier's prophecy that the 20th Century belongs to Canada still remains a matter of hopeful conjecture. The determination and resourcefulness of Canadians will be the deciding factors in proving this statement right or wrong.

The truth of Sir Wilfrid's forecast does not, at the moment, trouble the present generation, but it possesses inspiring qualities for those in whose hands destiny has placed the reins of fulfilment. Certainly there has never been an era in Canada, which presented such boundless opportunities for Canadians and for those who have come from other shores in the past decade.

Elsewhere in this issue we present a brief article by Hydro Chairman Dr. Richard L. Hearn relating to the challenges facing the competent and imaginative Canadian engineer today. Dr. Hearn, it will be noted, points out that the physicists and scientists are continually placing new discoveries before the engineers, which, in effect, demand "economic application to social purposes." In Ontario alone, the Commission is looking forward to 1980 when, it is anticipated, engineering genius and perseverance will have made it possible to produce some 7.5 million kilowatts of electricity a year from nuclear sources of energy, which will combine with other types of power generation to form total resources presently estimated at approximately 23.6 million kw.

Dr. Hearn's contention that "there has never been a time when the professional man has had such a wide panorama of opportunities placed before him" echoes the sentiments expressed in a recent address by Cyrus Eaton, Canadian-born financier and industrial leader. Speaking to members of the Canadian Institute of Mining and Metallurgy, Mr. Eaton stressed that Canada presents a happy paradox in a world where most nations are confronted by pressure of population and a scarcity of raw materials. On the other hand, Canada although long an acknowledged leader in mining, has "barely scratched the surface of her limitless mineral resources."

Canada's manufacturing interests are growing rapidly too, Mr. Eaton told his audience, while "her electric power industry, upon which mining and manufacturing depend for their energy requirements, is capable of almost infinite expansion."

Thus Canada, and particularly the Canadian north, offers the richest rewards — both spiritual and material — for those imbued with a desire to work and who take "supreme satisfaction in meeting and overcoming formidable obstacles."

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## COVER SHOTS

KITCHENER, as the first municipality to receive power from Ontario Hydro, was the setting for an important Hydro Golden Jubilee ceremony on May 14 this year to mark the creation of the Commission on May 14, 1906. Saluting that progressive city, this month's front cover depicts the triumphal parade there on October 11, 1910, led by Ontario's Prime Minister Sir James Whitney and Hydro's first Chairman, Hon. (later Sir) Adam Beck, when power transmitted by Hydro from Niagara Falls, was officially "turned on."

Marking another Hydro milestone, the back cover traces the harnessing of Nipigon River hydro-electric resources at its Alexander plant to aid northern Ontario's development.





### DOORWAY TO A NEW ERA

**T**HIS IMPRESSIVE main entrance of the new headquarters of Hydro's West Central Region at Hamilton symbolizes the important role the building is destined to play in administering the Commission's electrical services for one of Ontario's most heavily-industrialized

and thickly-populated areas. Officially opened recently by Hydro Chairman Dr. Richard L. Hearn (see Page 12), the new building is one of three new regional headquarters to be completed this year, the others being located at Ottawa and North Bay.

Industrialist, lumberman, railroad president and legislative member, Elias Weber Bingeman Snider helped to lay the foundations for Ontario's progressive Hydro enterprise.



ELIAS WEBER BINGEMAN SNIDER

# PUBLIC

ON MAY 14 this year the municipalities of Ontario gathered at Kitchener to salute the Golden Jubilee of Hydro and to honor the memory of a pioneer son of the district and one of the chief architects of this unique, province-wide power enterprise — Elias Weber Bingeman Snider!

Who was E. W. B. Snider?

In his day, it was written of him that he was a "careful, clear-headed man" . . . no doubt a heritage of his Swiss and Pennsylvania ancestors.

A study of his phenomenal career, will reveal that he was a progressive and farsighted industrialist, who might well be one of Canada's top financiers today as he was in his own time; a public servant, who sat 13 years in the Ontario Legislature — and a family man with seven sons and four daughters. Sooner than most, he saw what Canada had become and he helped mould the future of Canada in industry, politics and progressive thought.

A man of vision and determination, he surrounded himself with men of enthusiasm, leading them surely along the paths he had already chosen. His sincere love for his native province led him to study the possibilities of public ownership of electric power in Ontario and his drive and energy along this path

were crystalized in the founding of Ontario Hydro. "E.W.B.," with his devotion to the cause, welded the diverse elements about him into a cohesive whole, so that, today, he stands with men like Adam Beck and D. B. Detweiler, as one of the pioneers of this growing organization.

## Pioneering Background

To understand E. W. B. Snider and his associates, and their interest in the municipal ownership of Hydro power, it is necessary to go back into history and examine the stock from which they sprang.

In the year 1708, Britain's Queen Anne gave refuge to several thousand persecuted Palatinates from southern Germany and Switzerland. Some 3,000 of these refugees were sent to Ireland and later many emigrated to the United States, settling in Pennsylvania and then in Upper Canada — now Ontario.

Practically the entire southern section of Upper Canada was settled by these industrious Germans . . . the Niagara Peninsula, starting in 1776, the Detroit area in 1778, eastern Ontario from Prince Edward County to Dundas County in 1784, York County in 1793, and Waterloo County in 1800. Their wide distribution over the most productive areas of the province has had a profound influence upon the character and history of Ontario.

The first Palatinates came to Up-

---

(First in a series on the lives of E. W. B. Snider, Daniel B. Detweiler and Sir Adam Beck, Hydro pioneers.)

per Canada from New York State, not Pennsylvania. Closely associated with them, as early settlers, were French Huguenots and Quakers. Although comprising three different nationalities, they had many things in common: they were strong individualists, who wished to live their lives without dictation; their religious beliefs were deep and abiding and much in the same tenor. These ties were further strengthened by intermarriage of the groups.

## Historic Beginnings

The settlement in Waterloo County began around 1796 when the first conestogo wagon hove into sight over the horizon. Here came the people who were to settle this area and help make it great through their industry and knowledge. What these men and woman, many of whom trudged afoot from the States, brought, was not only a new agriculture, but also a culture to integrate into the burgeoning of their adopted country. Besides knowing how to cut trees, sow seed and reap harvests, build bank barns to store grain, breed and protect livestock, and use fertilizer and rotate crops to conserve the land for those who followed their straight furrows, they had a new speech, a deep-rooted folklore, incomparable folk arts, and an appreciation of good food.

What they left behind was a heritage that raised men like E. W. B. Snider, imbued from the cradle with the spirit of the pioneer and a dedication of purpose.

When E. W. B. Snider set out



# POWER PIONEER

to achieve public ownership of Hydro power, he was only following the tradition of those pioneer men and women, who constantly sought new horizons to quench their restless, unconquerable spirits.

## "E.W.B.'s" Amazing Career

Elias Weber Bingeman Snider was born in the Town of Waterloo on June 19, 1842, a son of the Rev. Elias Snider and Hannah Bingeman. While his father was a farmer and had flour and sawmills

in Waterloo and the surrounding township, he was also a devout Mennonite. He was ordained to the ministry of the church in 1874. At this time, the father took a large part in aiding Russian Mennonites to settle in Manitoba.

E.W.B.'s only surviving son is William W. Snider, who resides at

*(Continued on Page 4)*



△

REPRODUCTION of an early sketch (below) of the home and property of E. W. B. Snider at St. Jacobs. Miss Amy Snider, one of three surviving children of the distinguished Hydro pioneer, still resides in the attractive Snider residence, shown in the photograph (above).

▽







ELIAS SNIDER took over this flour mill at St. Jacobs from his father in 1871 and it remained the cornerstone of his numerous and varied business enterprises until his death in 1921.

St. Jacobs and whose memories of his father are keen and appreciative. In his possession is the Snider family Bible, brought from Switzerland, which records the entire history of the Sniders on its pages. This Bible, printed in 1560, was purchased four years later by Johannes Schneider, as the name appears to have been spelt originally. In 1736, another Johannes Schneider in this family of ancient lineage, emigrated to Pennsylvania, then a British colony, a fact duly recorded in the family pages of the brass-bound Bible. E.W.B.'s great-grandfather, Christian Snider, came to Upper Canada from Pennsylvania in 1806, as one of the pioneers of Waterloo County.

In those days, the sons went into the father's business as quickly as possible. So it is not surprising to find that E. W. B. Snider, who actually did not stop learning all his long life, received only the barest public school education before he

went to work on his father's farm at the age of twelve. When he was 17 he started in as an apprentice at his father's flour mill at German Mills. Three years later, so great was his early business acumen, he was promoted to manager.

The industrial genius that was to make him a wealthy man and a leading figure of his time then asserted itself in the enterprising young man. In October, 1864, he proposed to his father that he run the mill for him on shares. This arrangement prospered for the next seven years.

It was in January, 1871, that E.W.B. first went into business for himself, purchasing the flour mill at St. Jacobs. This must have been quite a venture for a young man with a growing family, but Mr. Snider had ideas.

A miller by the name of John Braun gave him glowing accounts of milling processes then being used

in Austria and Germany. They seemed far ahead of the methods to which Canadian mills were accustomed. His curiosity was further aroused by W. M. Stark, Toronto, as Elliott Richmond relates in his account of Mr. Snider's career, contained in the *"Ninth Annual Report of the Waterloo Historical Society."* Mr. Stark gave him the first samples of the roller process flour he had received from mills in Hungary.

Until this time, the milling of flour by the stone process had been singularly laborious. To obtain the right quality of flour necessitated several "reductions." Milling was a precarious business, with many falling by the wayside. It took great determination and unceasing hard work to be a successful miller.

E. W. B. Snider was fired by what he learned of the roller process. To him, it represented a revolution in milling. It meant finer flour, better working conditions, higher profits, expanding markets. He was anxious to try the roller process in his own mill, as he felt its gradual reduction system superior to the short process of grinding with millstones.

To think with E.W.B., was to act. On April 26, 1875, he placed an order with the firm of Hoerde and Company, at Vienna, Austria, for a roller process machine. As far as is known, this was the first such machine imported to this continent. It was shipped from Hamburg, Germany, to Guelph, Ontario, and was then installed in the Snider Flour Mill at St. Jacobs — the whole deal, with freight charges and import duty, amounting to some \$700. This represented a considerable amount of capital for a young manufacturer to risk on a new machine, whose results were known only in faraway Europe. Mr. Stark reports that he visited the big mills in Minneapolis (where flour was king), a short time after E.W.B. had his machine in operation and found them still grinding with stones.



The flour produced by Mr. Snider's mill was so far superior to that made under the old processes and his quick mind was so bent at all times upon improvements and refinements to the amazing new method, that the flour rapidly became famous under the name of "Walzen," which Mr. Snider coined from the German name of the roller process machine, "Walzentuhle." "Walzen" achieved fame for its superiority throughout the Maritimes, Ontario and the New England States. It was also shipped to Montreal for export abroad, carrying the new name of the "Dominion of Canada" into distant places. The Snider mill expanded rapidly, producing between 150 and 175 barrels a day.

The restless, questing blood of his ancestors gave E.W.B. no peace. His products were already selling in the east; now he looked towards the west, where the wagons were once again rolling back the frontiers and the "head-of-steel" was being pushed nearer and nearer the distant Pacific.

### Industrial Genius

An any rate, E.W.B., at the age of 42, decided to branch out as a manufacturer. For some time, he had realized it was not enough to mill the flour. First, the wheat had to be grown and this required agricultural implements. The rolling prairies of the west could, apparently, grow the world's best wheat, but they needed machines for the job.

Accordingly, he bought Jacob Bricker's foundry at Waterloo, entering into a partnership with Levi Bricker, which continued for 10 years. At the same

time, he persuaded men like Absalom Merner to incorporate the Waterloo Manufacturing Company. This amalgamated the Bricker foundry and Merner foundries in Waterloo and Elmira into the Waterloo Manufacturing Company Limited. Named president of this concern, Mr. Snider continued at this post throughout his life.

It was no small venture. The company, which made traction and portable engines and threshing machines, was capitalized at \$300,000 and employed some 150 men. The output of the factories went west, and, so great was the demand, a large plant had to be built at Winnipeg.

Thus E.W.B.'s dream of expanding with Canada was realized. His machines went west to help plant and reap the wheat; the wheat came east to be milled in his Ontario mills and shipped to the Maritimes. This surely made E. W. B. Snider one of Canada's first Dominion-wide industrialists.

Several years before this, in 1880, E.W.B. had entered upon another enterprise with the establishment of the Snider Lumber Company. This company operated a saw-mill at Gravenhurst, Ontario, and turned out large quantities of lumber.

The seeking mind of this great man also noted that all the products of his St. Jacobs mill had to be teamed to the station at Waterloo. To overcome that costly haul, E.W.B. promoted the Waterloo Junction Railway (also known as the Berlin and Elmira Railway Company), of which he was made provisional president. This road became part of the Grand Trunk Railway, which was, in turn, absorbed by the C.N.R.

His personal life was as happy and rewarding as his business life was successful. In 1864, he married Nancy Weber, daughter of David Weber, and they had seven sons and four daughters. All of his seven sons entered the various family businesses and held posts of responsibility. Of the large family only one son, William W. Snider, St. Jacobs, and two daughters, Amy (who still lives in the family residence at St. Jacobs) and Ada, of Toronto, survive.

### Devoted Public Servant

With his manifold interests, E.W.B. Snider did not neglect the side of the character he had inherited that urged upon him the need of participating in public affairs. He was an active member of the Canadian Manufacturers' Association. From 1881 to 1894 he represented North Waterloo in the Ontario Legislature. He was responsible for much good legislation, including the Municipal Fire Insurance Bill, an amendment to the Assessment Act and improvements in Forest Reservation and Preservation, which interested him as a progressive lumberman. Declining renomination for the Ontario House, he contested the same riding federally in 1896, but without success.

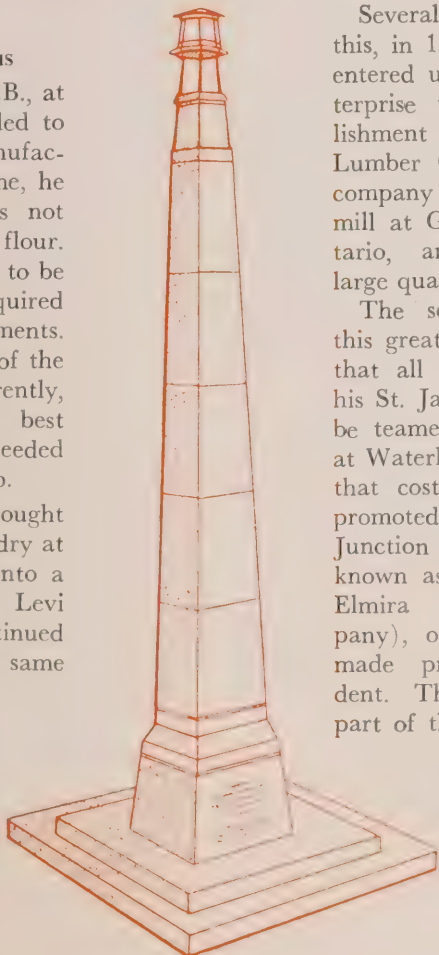
For some time, E.W.B. Snider had been contemplating the new miracle of electricity. He was aware of its potentialities, not only for the manufacturer, but also for the homeowner and farmer. Although the ability to flick a light switch and have a room illuminated by electricity has become a commonplace, only a few men of vision foresaw, the latent possibilities of this new force.

On to the scene, now comes another extraordinary figure . . . Daniel B. Detweiler.

It is exceedingly difficult for the student of the history of this period to evaluate the roles of the two men and place them in their proper perspective. Some of the records that would provide the complete story are missing. All that can be

*(Continued on Page 6)*

ARTIST'S drawing of St. Jacobs monument dedicated to Mr. Snider's memory by Hydro representatives on May 14.





◁ ONLY surviving son, William W. Snider (now 82), nostalgically examines the Snider Bible, printed in Zurich, Switzerland, in 1560, containing family history for some four centuries.

done is to assess their relationship against the known facts. When this is done, there emerges clearly the picture of two men with a single purpose, who worked for a time along parallel lines that finally managed to converge and who, each in his own right, deserves the proud appellation of "Father of Hydro Power." It is seen that one complements the other and that each needed the other for the fulfilment of the dream they shared in equal measure.

Two more dissimilar individuals could not have set out upon the quest. They had been friends for years, as D. B. Detweiler had been employed at a cheese factory at St. Jacobs for a period. But E. W. B. Snider was a wealthy and prominent man, with considerable influence and prestige: "careful and clear-headed," imbued with ideals of service but rooting them in a hard, sound business sense. On the other

hand, D. B. Detweiler was an idealist, a man who dreamed great dreams and communicated them enthusiastically to others. He was indefatigable when on the trail of a new project of public service, constantly enlisting the assistance of others to support what many felt were "hare-brained schemes." It is worthy of note that these "hare-brained schemes" have left their mark upon Ontario history in the shape of the public ownership of electricity and the building of the Welland Canal, in which Mr. Detweiler was also associated with E. W. B. Snider, as founders of the Deep Waterways Association of Canada.

As early as 1886, D. B. Detweiler was talking at his native Roseville of the time when power from Niagara Falls would pass through the community. His fantastic notions were received with good-natured

laughter. Who would ever live to see the impossible?

The two friends talked often on the subject . . . Detweiler spilling out ideas, Snider countering with considered proposals.

### A Far-Reaching Prediction

A respected and influential man, it was felt Mr. Snider's words would carry the needed weight. Accordingly, Mr. Snider addressed the banquet of the Waterloo Board of Trade on February 11, 1902. In this now-famous speech, he predicted that the majority of those present would see the day when streets and homes would be lighted and the machinery of factories supplied with power generated at Niagara Falls. The prophesy was greeted with the same tolerant amusement that had been the lot of D. B. Detweiler's vision.

Snider and Detweiler were not the kind of men who discourage easily. E. W. B. Snider began to lay the solid foundations of the enterprise, this time a public one, as he would have gone about organizing one of his own successful businesses. He undertook extensive preliminary investigation into the development, transmission and distribution of Niagara power, without which all the persuasiveness in the world would have been of no avail.

Finally a committee was formed with E. W. B. Snider as Chairman and D. B. Detweiler as Secretary. The committee called a meeting at Berlin on June 9, 1902, and men came from miles around to hear how power could be brought from Niagara at greatly-reduced cost. The scoffers were now in the minority. A resolution appointed a select committee, including Snider and Detweiler in their respective positions, to . . . "prepare a co-operative plan for procuring a supply of electrical energy for the manufacturing interests on the most favorable terms. . ."

This was the turning-point that



led to the historic meeting of February 17, 1903, at Berlin (now Kitchener). The basement of the old Y.M.C.A. building at 24 North Queen Street was crowded with citizens, who had come from points as far away as Toronto and London.

And there, the third dramatic figure came upon the stage . . . Adam Beck.

This dynamic man, who was born at Baden, had the same strong streak of pioneering from his forebears as motivated Snider and Detweiler. Attending the 1903 meeting in Kitchener, he said simply, "I have come to learn," for all this was somewhat new thinking to him. But, as he listened to the report of the select committee, his imagination must have been fired by the prospects it opened, because he jumped to his feet to second an amendment made by Mayor Thomas Urquhart, of Toronto.

This amendment was loaded with consequences. In reading it, one can see the idea burgeoning far beyond

what even Snider and Detweiler had envisaged.

It read: "Therefore, be it resolved that we respectfully suggest to and urge upon the Ontario Government the advisability of the government building and operating as a government work, a line for the transmission of electricity from Niagara Falls to the towns and cities; and that the municipalities here represented call upon their representatives in the Legislative Assembly of Ontario to urge upon the government to carry out this resolution."

The amended report carried enthusiastically.

Here, then, is the genesis of Ontario Hydro, as it is known today. If E. W. B. Snider and D. B. Detweiler are entitled to the joint title of "Fathers of Hydro Power" then just as surely should Adam Beck be known as "Father of Hydro." One could not have existed without the other; that each came along to complement the other is

the good fortune of the people of Ontario.

### First Municipal Power Act

The Ontario Legislature on June 12, 1903, approved legislation entitled "An Act to Provide for the Construction of Municipal Power Works and the Transmission, Distribution and Supply of Electrical and Other Power and Energy." This act authorized the municipalities to appoint a Commission to inquire into the "feasibility and desirability of securing the establishment and operation of municipal power, heat and light works."

Things moved rapidly from that point. On July 9, 1903, a committee was formed during a meeting in Berlin with Mr. Snider as Chairman. This committee met in Toronto on July 16 and decided to ask all interested municipalities to send delegates to meet with it at the Toronto City Hall on August 12.

This meeting witnessed the formation of the Ontario Power Commission with, of course, Mr. Snider as Chairman.

For three years, the Commission worked on the preparation of a 128-page report, published on March 28, 1906, on the question of municipal development of power at Niagara Falls. Then, on September 20, 1906, the Commission held its last meeting. A Hydro-Electric Power Commission of Inquiry had been formed in 1905 and legislation enabling the formation of The Hydro-Electric Power Commission of Ontario was given Royal assent on May 14, 1906. E. W. B. Snider, then 65 years of age, announced his retirement from active participation in Hydro affairs, while realizing he would be interested in what he had helped to father until his death.

The work of the "careful, clear-headed man" was done; he had accomplished what he had set out to do and gracefully retired from active engagement in the great things that were afoot.

(Continued on Page 28)

the duties they assumed, and they now leave the matter and its issues in the hands of the public they have had the honor of representing.

Respectfully submitted.

E. W. B. Snider  
Chairman

P. W. Ellis

W. F. Cockshutt

Adam Beck

△

AS Chairman of the Ontario Power Commission, formed in 1903, Mr. Snider signed the 128-page report in 1906 along with P. W. Ellis, Toronto; W. F. Cockshutt, Brantford; Hon. Adam Beck, London and Prof. R. A. Fessenden, Washington, D.C., a consultant.



# THE YOUNG ENGINEER

by

**Richard L. Hearn, B. A. Sc., D. Eng.,  
Chairman, Ontario Hydro**

A JUNIOR engineer speaking to me recently asked, "If you were able to start your career over again, in what profession and in what country do you think the greatest opportunities would lie?" I answered that I should choose the engineering profession and that Canada would be as good a place as any to receive the imprint of a young engineer. Obviously my young friend had been wondering if he was making the best possible use of his talents in this age, which offers such a wide variety of prospects for the youth of today. I feel sure that he was disappointed in my answer and is probably convinced that all engineers are naturally conservative, addicted to undramatic statements.

In our youth I suppose we all harbor a secret longing for that "Golden Land of Opportunity." Yet I sometimes wonder what we would do if we found that fabulous place of our dreams. Would we make better use of our skills and provide a greater contribution to society? Looking back, I rather doubt it. Those mythical pastures beyond our reach are endowed with a brilliance of hue that sometimes blinds our better judgment.

I am not advocating for a moment that there should not be something of the dreamer's quality in all of us. A dream is often coupled with ambition, and an am-

bitious youth, properly directed, is an asset to any community.

Certainly a young man's chances of making dreams come true were never better than at present, if his dreams involve designing or building great structures and rockets to explore the universe, delving into electronic wonders, or applying discoveries in the field of nucleonics to peaceful uses. But certain basic qualities are required. Because a man can saw a piece of wood, he should not consider himself a capable carpenter. According to the *Encyclopaedia Britannica*, the qualifications for a professional engineer include, "intellectual and moral honesty, courage, independence of thought, fairness, good sense, sound judgment, perseverance, resourcefulness, ingenuity, orderliness, application, accuracy and endurance."

Having graduated and successfully applied these qualities to a profession, the engineer should, by the *Britannica's* standards, "have ability to observe, deduce, apply, to correlate cause and effect, to co-operate, to organize, to analyze situations and conditions, to state problems, to direct the efforts of others. He should know how to inform, convince and win confidence by skillful and right use of facts. He should

be alert, ready to learn, open-minded, but not credulous. He must be able to assemble facts, to investigate thoroughly, to discriminate clearly between assumption and proven knowledge. He should be a man of faith, one who perceives both difficulties and ways to surmount them. He should not only know mathematics and mechanics, but should be trained to methods of thought based on these fundamental branches of learning. Organized habits of memory and large capacity for information are necessary. He should have extensive knowledge of the sciences and other branches of learning and know intensively those things which concern his specialties. He must be a student throughout his career and keep abreast of human progress."

## Canada Needs Engineers

Assuming that a young man is able to live up to this high creed, there appears to be no reason why he should not undertake a career in engineering. There can be no doubt that Canada needs engineers and I venture to add that engineers can find the greatest scope for their knowledge in a country such as our own.

There are some that may believe that better prospects, in terms of compensation, await the engineer in the United States. Actually, only about 10 per cent of our university

(This article appeared in a recent issue of "The Line," published by Canadian Line Materials Limited, Toronto.)



graduates in engineering seek work south of the border and the majority of these are looking for post-graduate study. To offset this, there is an increasing number of enquiries from American students, who propose working in Canada. The reason is obvious. A growing young country can offer the type of challenge upon which engineers thrive. It is also indicated by surveys that starting salaries compare favorably in the two countries.

At the present time, there is a total of 11,341 students registered in various branches of engineering at Canadian universities. Of this number, more than 1,600 are expected to graduate this year and undoubtedly they will find a ready labor market awaiting them. Their future will then rest entirely upon their ability to adapt themselves to their chosen field of endeavor. (See accompanying article: "Aid for the Budding Engineer.")

If I may take my own organization as an example, it will serve to illustrate what may happen to the junior engineer who joins a large organization. Upon joining Ontario Hydro's Junior Engineer Training Program, the young graduate spends a short time on an orientation course. This is designed to acquaint the individual with the

organization and other engineers on the program, and to provide an opportunity to see some of the Commission's facilities and properties.

The course-members then embark upon individual job rotation programs, the first assignment being based on the indicated direction upon which the graduate wishes to embark. Toward the end of the first assignment, both the engineer and management have an opportunity to make a preliminary appraisal of the choice and to plan the remainder of the program. This program, which may vary in length from 12 to 24 months depending upon the assignment, is by no means rigid and may be revised at any time in the light of the individual's response to the work.

Undoubtedly the program I have just outlined will be broadened as the pattern of progress changes the need. Uppermost in our mind, at the present time, is the rapidly expanding field of nucleonics and the lack of trained engineers to either instruct the graduate or further develop the application of nuclear energy to peaceful uses. As each month passes, we find that the physicists and scientists have placed new discoveries before the engineers to undertake the economic application of science to social purposes. This places a tremendous responsibility upon the shoulders of the engineer — a responsibility which cannot be shirked or overlooked if Canada is to maintain its world position in technological development.

### Spirit of Progress

In Ontario, I think we can take pride in our past record of forward thinking and spirit of progress. Yet the future poses a very real problem if we do not take active steps to encourage the training of engineers in nucleonics and to provide some incentive for the junior engineer to enter this field, although, in this

regard, future prospects alone should provide sufficient incentive to any ambitious engineer.

An indication of what may develop in one branch of this new field was outlined recently when I was privileged to present a brief to the Royal Commission on Canada's Economic Prospects. I endeavored to point out that recent studies made by Ontario Hydro show that, if certain conditions prevail in the future, this province's major electrical utility could be faced with primary power requirements in the order

of almost 22 million kilowatts by 1980, compared with 4.2 million today. This means that we may have to provide resources totalling some 23.6 million kilowatts by the end of the next 25-year period.

A few years ago, the implications of a study of this nature would have been quite different from those of today. With limited hydraulic resources within economic transmission distance of load centres, Ontario would have had to resort to a great extent to conventional thermal generation. Now we have an alternative. By 1965 we assume that nuclear-electric stations will be economical for base load operation and one of our studies indicates that, by 1980, we may have 7.5 million kilowatts of nuclear-electric generation.

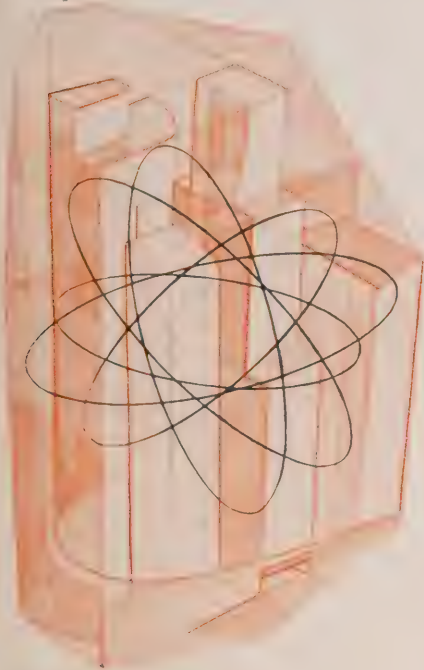
### Complicated Pattern

I bring these statistics to light once again to illustrate what I believe is a fairly obvious pattern. It is, however, a complicated pattern to some extent, for it brings into focus our whole educational system and the long-standing shortage of engineers. Speaking in Toronto last October, Dr. S. C. Hollister, Dean of the College of Engineering, Cornell University, made the following interesting statement, which illustrates what the pro-

(Continued on Page 10)



DR. RICHARD L. HEARN



fession must face. He said: "Out of the number of boys reaching age eighteen in a given year, only about 17 per cent have the necessary intellectual capacity to undertake work in the (engineering) profession. This same 17 per cent, however, must also supply the talent for other professions, such as law, medicine, science. They must also supply the top-level people in the crafts, including the better chefs, cabinet makers, glass blowers, tool makers, and the like."

### New Fields

In a profession, which is already heavily taxed, we must now seek graduates, who are capable of filling roles in such new fields as computing, automation, and nucleonics, as well as the more conventional branches of engineering. This may call for a complete revision of our educational methods, right from the primary schools through to the post-graduate level — and many notable people have expressed an opinion on this subject — as well as a revision of our system of guiding the youth into the most suitable profession for his particular capabilities. The responsibility, therefore, rests as much with the business world as with our educators. Unless management can communicate, for example, the possibilities and attractive qualities of nuclear engineering to the junior engineer, we shall certainly find ourselves in an unenviable position within a comparatively few years.

If I may be permitted to put one more thought onto paper, I should like to say that there has never been a time when the professional man has had such a wide panorama of opportunities placed before him. To the junior engineer of today will go the key positions of tomorrow. The future rests largely with the young man himself and, in deciding which avenue he will take, he should be guided by the needs of society, the ultimate purpose of his job and its place in the order of the universe. Frankly, my own choice would be nuclear engineering. ■

## AID FOR THE BUDDING ENGINEER

**M**ENTION of the registration at Canadian universities this year, in the accompanying article, brings to mind the assistance now provided for undergraduates and graduates in applied science and engineering courses. This year, for example, ten students registered in engineering and technical courses are continuing their studies at three Ontario universities and three other educational institutions with the help of the 1955 Ontario Hydro Scholarships. Inaugurated in 1952, the Hydro scholarships, with a total value of almost \$3,000 are presented as a tribute to the distinguished achievements of graduates in the engineering and technical professions and for the purpose of encouraging and assisting promising students in these fields.

The Commission has approved two scholarships of \$300 each in the first and second years at the University of Western Ontario — the first engineering scholarships awarded at this university to date.

Three scholarships of \$300 each are awarded at Queen's University, Kingston, and the University of Toronto. A \$100 scholarship is presented annually to the most worthy cadet at the Royal Military College of Canada, Kingston, entering his fourth year of the college's electrical engineering course. At the Ryerson Institute of Technology, Toronto, Ontario Hydro presents a \$100 scholarship. A \$300 scholarship is presented at Port Arthur's Lakehead Technical Institute in support of the training being given in the school's applied science course.

Many forward-looking organizations and individuals are also actively promoting and encouraging an interest in engineering and science courses among young Cana-

dians today by their support of scholarships, awards, bursaries, and student-aid loan funds at various universities and other schools across the nation.

For example, at the University of Toronto, approximately 12 admission scholarships are awarded by the university to students entering the first year of a course in the Faculty of Applied Science and Engineering. For undergraduates in the Applied Science and Engineering courses, some 60 scholarships are available, being awarded for academic attainment. The foregoing does not include, however, War Memorial and Leonard Foundation Scholarships; bursaries from the Atkinson and Bickell Foundations; Dominion-Provincial Student Aid and University of Toronto General Bursaries, as well as a large number of loan funds, out of which there must be several grants each year, financial need being the primary consideration in most cases.

At Queen's University, a total of 42 entrance and matriculation scholarships are open to engineering and other students. A total of 121 engineering undergraduate scholarships are awarded at Queen's, while 32 engineering graduate scholarships are also presented.

For students entering the Engineering year at McMaster University, Hamilton, a special \$50 bursary is presented by the Women's Auxiliary of the Hamilton Branch, Engineering Institute of Canada. Students entering this course may also compete for the regular matriculation scholarships. Carleton College, Ottawa, also awards two scholarships to engineering students specifically. Two other scholarships are also open to engineering students.

—Editor's Note.



# AURORA REMEMBERS 1906



AURORA, a progressive municipality north of Toronto, had a modest Hydro Golden Jubilee celebration a few weeks ago.

The reason for this "jubilation" was the removal of wooden poles from Yonge St., the community's main thoroughfare. Erected in 1906 (the year in which Ontario Hydro came into being), by crews of the Toronto and York Radial Company, the poles have latterly carried a 27,600-volt Ontario Hydro transmission line serving Aurora and

customers in Hydro's Richmond Hill Area.

With the recent widening of Yonge St. and the installation of a mercury-vapor street lighting system on steel standards (one of the earliest installations in Ontario of this type of illumination on record) by the Aurora Hydro-Electric Commission, it was considered advisable to locate the line on a route bypassing the town.

Participating in this civic improvement and paying a major share of the line-relocation project, Ontario Hydro sent a Construction Division crew to Aurora recently to

take out the wooden poles. On hand to witness the demolition was Frank Tate, retired General Foreman of the Commission's Richmond Hill Area staff. Still energetic and showing the same enthusiasm for Hydro work as he did when he joined the Commission in 1930, Mr. Tate was given the honor of cutting down one of the venerable poles with the aid of a power-operated saw.

An article in the *Aurora Banner* quotes Mr. Tate as saying "those poles come down easier than they went up."

Engaged as a lineman with the Toronto and York Radial Company in 1906, when the poles were installed, Mr. Tate recalled that there were no power diggers, Winston derricks, cranes or winches for line-erection.

"This was done by hand and a strong back. All we had in the way of equipment was a work car and a few pike poles to help in lifting the 45- and 50-foot poles."

Yonge St., 50 years ago, was a narrow road with a cobble-stone surface. Lined with maple trees, Aurora's main street, with only the occasional store or private residence on either side, was chosen as the route of the Toronto and York Radial Company. This company operated the electric radial cars between Toronto and Newmarket.

In the spring of 1906 when the line and poles were erected to operate the radial cars, the whole community applauded. "There was as much excitement when they were put up as there is to see them come down," Mr. Tate stated. ■



WATCHING Frank Tate (holding power saw), retired Ontario Hydro employee, remove one of the poles he helped to erect on Aurora's main thoroughfare, Yonge St., in 1906 are, standing left to right: Al. Hartford, Max Campbell, Chesley Peach, Superintendent Bruce Marshall, Foreman Gordon Styles, Herbert Anderson (partially hidden by the pole), Ontario Hydro; Donald Glass, Chairman, Aurora Hydro-Electric Commission; Mayor Dr. E. J. Henderson; Douglas Gerrow, Ontario Hydro, and Aurora Hydro Superintendent Charles C. Copland.



HON. W. K. WARRENDER, Hydro Vice-Chairman, left, assists Chairman Dr. Richard L. Hearn to cut the symbolic ribbon marking the opening of the new regional building.

**M**ARCH 21 this year was an auspicious day for Hamilton as Ontario Hydro marked the official opening of the new headquarters of its West Central Region. Located on Main Street West in that city, the handsome structure drew admiring comments from many utility commissioners and managers and other guests on hand for the ribbon-cutting ceremony.

The new nerve-centre of Hydro in this highly industrialized and progressive region replaces the former regional quarters in Hamilton's Terminal Building. The West Central Region extends from Lake Erie on the south to Lake Huron on the north and covers a fairly wide area across the mid-portion of the western part of Ontario, incorporating an area of 5,200 square miles.

Designed to meet the growing administrative responsibilities of the region, provision has been made in the design of the new building for future expansion.

The L-shaped structure comprises two storeys and a basement. Planned by Ontario Hydro architects and built by the Arnold Construction Company of Hamilton, it contains an overall floor space of 33,000 square feet. Combining many of the latest architectural and structural features, the new headquarters is essentially functional in design. Plans for the building permit a flexible arrangement of office space, which may be altered to meet changing requirements. This is accomplished by means of movable partitions, with lighting and air conditioning systems geared to function efficiently regardless of the wall positions.

The exterior is of buff-colored brick, with stone facing over the entrance, while large double-glazed windows ensure maximum insulation and natural lighting. Interior features include recessed fluorescent lighting and a pleasing color scheme. Power and communication facilities throughout the building are contained in an underfloor duct system.

The new building is located in front of the Hamilton-Newton Transformer Station on grounds, which will be landscaped in the next few months. For the conveni-

ence of the staff and public, accommodation for 65 cars is provided on a paved parking lot.

#### Many Attend Opening

Guests attended the opening ceremonies from all sections of the region and were met and welcomed in the lobby by O. S. Russell, Manager, and department heads.

Included in the list of officials and guests present were: Dr. Richard L. Hearn, Hydro Chairman; Hon. William K. Warrender, Q.C., Vice-Chairman, and M.L.A. for Hamilton-Centre; Controller J. A. MacDonald, Hamilton, representing Mayor Lloyd D. Jackson; Lt.-Col. H. H. Newman, President of the Hamilton Council of Churches; W. Ross Strike, Q.C., Vice-Chairman; A. A. Kennedy, Commissioner, Ontario Hydro; J. M. Hambley, Assistant General Manager-Administration; E. H. Banks, Assistant General Manager and Comptroller; R. H. Hillery, Administrative Assistant, Regions; H. J. Sissons, Executive Assistant; K. H. Candy, Commission Architect; E. A. Washburn, President, and W. R. Mathieson, Secretary, Association of Municipal Electrical Utilities; Gordon H. Fuller, President, and D. P. Cliff, Secretary, Ontario Municipal

# Another step

**Hydro Chairman officially opens  
new regional building at Hamilton**





Electric Association; W. B. Elliott, President, District 5, and T. J. Moffat, President, District 6, Ontario Municipal Electric Association, and other municipal and utility officials, as well as representatives of the press and radio.

As the guests assembled they were arranged in small groups and taken on a tour of the building. Each group was conducted by one of the ladies of the regional staff. The tour proceeded from the lobby through the first floor, then to the second floor and from there to the



ONE of the busiest offices is the region's Electrical Inspection Department. This view of the department's reception area provides a conception of the attractive interior of the headquarters building.

EXPANSION of Hydro service in the bustling West Central Region was "on the boards" as this drafting-room photo was taken.

Assembly Hall in the basement for the opening ceremony. A stop was made at each of the 17 functional sections, where a member of the staff of that section was introduced to the group and then gave a brief outline of the duties and the work of this section.

At five o'clock, the guests and staff gathered in the Assembly Hall where Mr. Russell presided at the ribbon-cutting ceremonies.

Mr. Russell spoke briefly on the formation, the responsibilities and the history of the region. He then called on Controller J. A. MacDonald to extend a civic welcome from the City of Hamilton, followed by the introduction of Dr. Hearn.

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MISS IRENE BURTON, a member of the regional staff, seated, received a visit from a jovial group, left to right, N. A. Grandfield and W. S. Pettit, Brantford; Hon. W. K. Warrender; Regional Manager O. S. Russell, W. D. Stalker, Simcoe; N. R. Craig, Burlington, and T. J. Moffat, Listowel. These gentlemen formed one of several groups, which toured the new building.

REPLACING former quarters in Hamilton's Terminal Building, the functional, two-storey structure provides 33,000 square feet of floor space.







# PATHWAYS TO POWER

Chapter V — Part II

## HYDRAULIC MODELS

By D. G. Harkness\*

THIS spectacular but efficient log chute (left) at the George W. Rayner Generating Station on the Mississagi River was constructed after completion of extensive model studies.





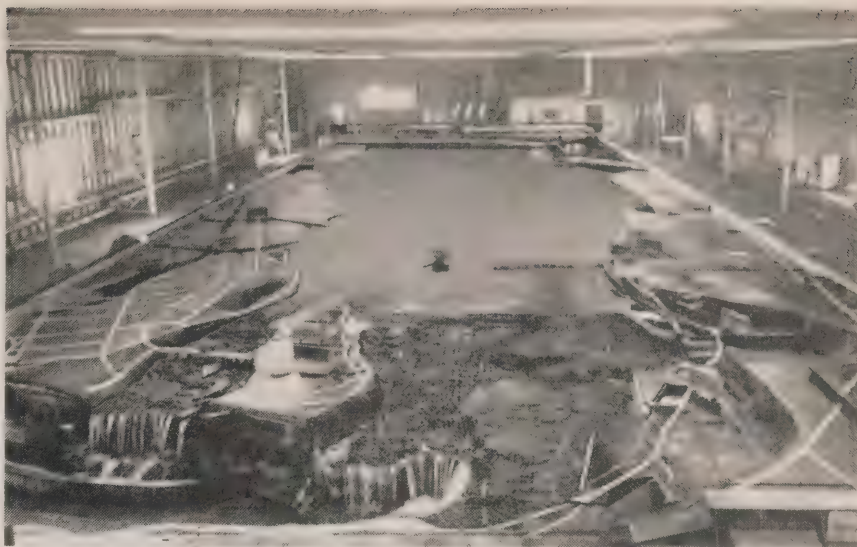
**H**YDRAULIC tests of an entirely different nature to those described in the previous chapter are made upon hydraulic models to assist in the design of structures, channels and equipment.

Most problems of hydraulic design are within the range of solution by analytical methods, but frequently, because of the great number of variable factors present, a simpler and more reliable result can be secured by building a scale model of the structure or river channel in question and conducting experiments upon it to secure the desired results in the prototype.

The diversity of problems calling for solution by model tests in connection with waterpower projects is very great. Numerous examples will be used in this chapter to illustrate some of their applications.

Ontario Hydro's George W. Rayner Generating Station on the Mississagi River in northern Ontario, in which the operating head is over 200 feet, was built on a river where large amounts of timber, both pulpwood and sawlogs, are being cut. The dam and powerhouse span a narrow canyon with almost vertical walls. It was necessary to build a log chute to convey this timber from the forebay through a vertical height of 210 feet to the tailrace channel, where the logs must be discharged without permitting damage by impinging on the walls of the gorge or the bed of the tailrace channel. The model indicated several desirable revisions in the original design and effected economy in the use of water, steady movement of the logs without jamming at the entrance to and exit from the chute and their discharge without damage into the tailrace.

In another instance, a gate was designed for use in the closure of sluices in a dam under construction, the sluices being 38 feet wide with water flowing through the sluices up to 24 feet in depth on the



BUILT on a scale of 1 to 250 horizontally and 1 to 50 vertically, this experimental model of Niagara Falls and the upper river was used in preparing plans for Hydro's Sir Adam Beck-Niagara Generating Station No. 2, as well as the international Niagara remedial program.

sill. A scale model of the gate and one of the sluices indicated that the gate, as originally designed, would not close because of the uplift of the water flowing through the sluice. Various revisions in the design, made in accordance with the measurements of the test, enabled a structure to be built that functioned most satisfactorily.

Several other problems in connection with the operation of the gate were also solved satisfactorily by the same model, one of these being to prevent the collection of debris at the sill of the gate, which would impede or prevent closure of the gate.

Other model tests have dealt with the design of straight and curved channels, surges in channels, design of sluices, of facilities for dissipating energy at the toe of an overfall dam, power plant intakes, metering devices and many others.

Hydraulic model testing is essentially a laboratory problem and the hydraulic laboratory facilities of universities in this country, the United States and Europe have been used for investigations in connection with hundreds of waterpower projects. The Commission has also built several models, which are too large

to be accommodated in any available laboratory.

### Niagara Model

Prior to and during the construction of the 12-unit phase of the Sir Adam Beck-Niagara Generating Station No. 2, Ontario Hydro hydraulic engineers built six separate models of various parts of the development the largest being housed at the A. W. Manby Service Centre, Islington, near Toronto. The five other undistorted structure models of the water-conveying system were constructed and tested in the river-flow laboratory at the University of Toronto. Tests on these models resulted in net savings in construction of more than \$5 million.

At the present time, eight models of sections of the St. Lawrence Seaway and Power Project are under test.

Also located at the A. W. Manby Service Centre, these models accurately reproduce the International Rapids Section of the St. Lawrence and actual river conditions. Built from data obtained from Ontario Hydro and other surveys, the models have permitted engineers to test methods of building the power pro-

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\* (Mr. Harkness is Assistant Hydraulic Engineer-Design, Generation Department, Ontario Hydro.)



ject before construction began; to determine the best type of construction of the principal structures and the manner in which they will be built. Engineering design studies are continuing on these models.

Contractors associated with the project have been able to study Hydro's hydraulic models in order to determine the exact sites of the various structures, topography of the surrounding terrain, the best means of access to the sites and the velocities of the St. Lawrence River with which the contractor would have to contend.

There are three topographical models of the St. Lawrence River, each representing a section of the river. The first represents the river between Ogdensburg and Leishman's Point, being used in tests relating to channel enlargements and determining performance for power and navigation purposes. Another function of this model has been to

determine the best location, as well as the alignment and associated excavations for the Iroquois dam, which will control the outflow from Lake Ontario. The second model represents the Ogden Island area (from Iroquois to below Morrisburg) and has been used in tests associated with the design of channel enlargements and determining their performance for power and navigation. The third model reproduces the area from Cat Island to a point below the powerhouses, being used in designing channel excavations and determining cofferdam requirements during dewatering and construction of the powerhouses and the Long Sault dam.

Combined, the three models reproduce about 35½ miles of the St. Lawrence River, with one mile on the St. Lawrence equal to about 10½ feet on the models.

### Scale Relationships

The actual scale relationships are as follows: horizontal, 1 foot to 500 feet; vertical, 1 foot to 100 feet; rate of flow, 1 to 500,000 cubic

feet per second; velocity, 1 to 10 feet per second and time, 1 hour to 50 hours. The vertical scale of the models is exaggerated in comparison with the horizontal scale so that the effect of vertical variations in contour—which are much smaller than the horizontal distances—will not be lost. This also assures a more accurate representation of the river levels.

The fact that the reproduction is in three sections would appear to be something of a handicap in that the whole development cannot be studied as one unit. However, in addition to the fact that the length of the present building housing the models would have to be tripled to house a single model of the entire development area, there are distinct advantages to the three-section reproduction. The single-unit model would hinder detailed study of the specific work areas, while the three-section plan allows study on each section simultaneously without interference from the work being done on either one of the other sections.

Model construction, of course, is

CONSTRUCTION of the third topographic model of a portion of the St. Lawrence River. The two other topographic models are also visible.





done with the precision of lens-grinding. Precision was evident, not only in the marking of contours, sawing of the templates, surfacing, insertion of some 20,000 metal strips to reproduce roughness in the river bed, but also in the precautions taken to prevent foundation settlement and heaving due to frost.

### Structure Models

To study particular problems arising out of tests conducted on the three topographical models mentioned above, Commission engineers have built five models of individual structures involved in the project.

These structures are reproduced in enlarged form compared to their counterparts in the topographical models in order to permit more detailed study of each structure than would be possible in the overall models.

Unlike the topographical models which, as indicated above, are distorted on the vertical scale as compared with the horizontal scale, these latter models are built to exact proportions.

The first structure model, built to a scale of 1 foot to 36 feet, both horizontally and vertically, reproduces the powerhouse ice chutes. Tests on this model have been used in the design of the ice chute profile and types of gates required, as well as to determine performance characteristics.

### Long Sault Dam

The second is a model of the Long Sault dam and vicinity, built on a scale of 1 to 80, and has been used to determine performance and rating of diversion sluices, tunnel ports, final sluiceways and energy dissipating works. This model has also been studied to determine necessary channel excavations for efficient functioning of the elements mentioned in the previous sentence.

A plexiglass-sided testing flume, 20 feet long, has been constructed to determine hydraulic design details of components of both the Long

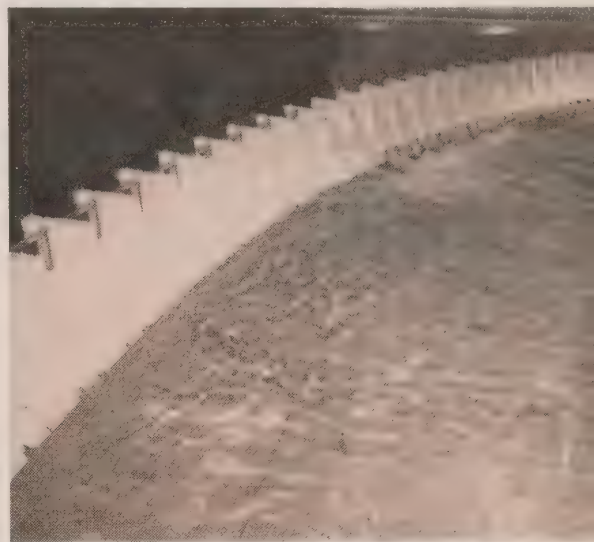
Sault and Iroquois dams and to develop and determine performance of energy dissipating works for both structures, as well as to measure hydraulic loads on various gate types and designs.

### Massena Intake Works

Another structure replica, constructed on a scale of 1 to 60, is a model of the Massena intake works and vicinity, being used to determine the alignment of structure and design of submerged ports and energy dissipating works. Another function of this model is to determine the performance of the ports and their ratings, in addition to measuring hydraulic loadings on the service and emergency gates.

Recently completed is a scale model, 1 to 36, of the powerhouse water passages, built to measure the hydraulic loadings on the headgates and to determine the optimum location for piezometer

*(Continued on Page 32)*



INDIVIDUAL model of the important Long Sault dam and vicinity, indicating the action of the energy dissipating works located at the toe of the structure.

HYDRO engineers Wolf Jenkner (left) and Cliff Davidge measure St. Lawrence water levels in Model No. 1. Measuring is done with a point gauge, which is supported by a "dolly" on the instrument truss. The truss runs on precisely-levelled machined rails laid on both sides of the model.



# ANNIVERSARY CELEBRATION

**Toronto Lakeshore Communities mark Hydro  
Golden Jubilee at Festive Mimico P.U.C. Dinner**



HYDRO Golden Jubilee banners awakened poignant memories for John J. Harrison, first Mayor of Mimico, who signed the first contract for power with Hydro in 1911.

**G**UESTS from 13 municipalities and more than 100 leaders of community activities in the Toronto Metropolitan area assembled at the Dutch Sisters Inn at Mimico on the evening of April 13 for one of the initial celebrations associated with the Hydro Golden Jubilee.

That Hydro is regarded as an integral and inseparable part of the way of life in Ontario's rapidly-growing suburban and metropolitan communities and not as something aloofly distinctive was emphasized by the manner in which proceedings were conducted. Under the auspices of the Mimico Public Utilities Commission, with its Chairman, Amos Waites, presiding, and Hydro banners on the wall, the celebration had an expansive character. A large number of those present availed themselves of the opportunity to say something about education, community welfare and kindred activities. Others spoke of the benefits derived by municipalities through inclusion in the Metropolitan system. Fourteen chiefs of police, in-

cluding Chief Constable John Chisholm, Toronto, were on hand to pay tribute to Fred Herman, the retiring Chief of Police of Mimico. Through this colorful, oratorical fabric ran the Golden Jubilee thread, to be caught up and temporarily detached by A. A. Kennedy, Ontario Hydro Commissioner, and other Hydro speakers.

Introduced by Mayor W. A. Edwards, who had greeted the assembly with characteristic words of welcome, Mr. Kennedy drew attention to the fact that the foundations for much of the progress recorded by previous speakers was laid by a small number of municipalities, which battled for the creation of Ontario Hydro.

"If anywhere there is a feeling that a brick wall separates Ontario Hydro from the municipalities, I want to dispel it at once. The municipalities are part and parcel of the great Hydro organization and they should all join in these Jubilee celebrations," he said.

In this connection, the speaker intimated that the celebrations would create a friendly, informal atmosphere and pride in the achievements of the past, which would be of the greatest assistance in uniting the Hydro family for the effort that must be put forth

to meet the problems of the future.

"Are all the municipalities in a position to handle and distribute efficiently the new power that will be made available to them in the coming years?" he asked. "If they are neglectful about improving and extending their facilities to meet customer needs, then they are likely to become the weak links in the chain of power supply. I cannot urge them too strongly to think about it, because their attitude is vital to the whole undertaking."

Bert Merson, Chairman of the Toronto Electric Commissioners, humorously referred to an article in a London paper, which had challenged the calculations of Sir Adam Beck with respect to the power that would be required by the original municipalities entering the Hydro system.

"They made fun of his figures," observed Mr. Merson, "scoffed at them as fantastic. Now London alone is taking several times the amount of power Sir Adam figured out for the original 14 municipalities."

Speaking on behalf of the Ontario Municipal Electric Association, Mr. Merson expressed the hope that Hydro municipalities across the province would take their cue from Mimico and hold similar celebra-



tions where past achievements could be reviewed and a stimulus given to future planning.

### First Mayor Present

As Mr. Merson finished speaking, there was a skirl of music from piano and accordeon. It was a greeting to John J. Harrison, the first Mayor of Mimico and one of the staunchest supporters of Hydro in the early, battling days.

Mr. Harrison had come all the way from Westport, north of Kingston, to attend the celebration. He recalled that the Erindale Power Company was Hydro's chief competitor in the Lakeshore district in the years immediately following inauguration of the Ontario system.

"They wanted the Mimico council to sign a five-year contract with them for the supply of power," he said. "A resolution favoring this arrangement was actually passed. I thought that the only way to upset it was to have Adam Beck himself come out and address the people. He came and that was the end of it as far as the private company was concerned. It was on March 21, 1912, that we received our first first Hydro power."

Another ex-Mayor of Mimico, A. D. Norris, evoked much laughter by a racy description of conditions in the town before Hydro came. "There might as well have been a curfew," he said, "because you couldn't go out at night without wearing rubber boots and carrying a lantern in your hand."

Mrs. Marie Curtis, Reeve of Long Branch, spoke briefly but very much to the point, stating that it was of the greatest importance that Ontario Hydro and the municipalities should work together in making the Lakeshore communities ideal sites for prospective homebuilders.

Mrs. Dorothy Hague, the present Reeve of Swansea, a former Mimico High School teacher, recalled that "those were poorer times and salaries for teachers were meagre. Now prosperity is everywhere reflected and I think we owe a great



HEAD TABLE guests, left to right, Chief Constable John Chisholm, Toronto; Adam Smith, Manager, Toronto Region, Ontario Hydro (partially hidden); Mayor Harry Clarke, Weston; Mayor D. R. Russell, New Toronto; Reeve Mrs. Dorothy Hague, Swansea; (Ontario Hydro Commissioner A. A. Kennedy, speaking); Amos Waites, Chairman, Mimico P.U.C., and Mayor W. A. Edwards, Mimico, heard Mr. Kennedy stress the vital importance of gearing municipal distribution facilities to meet future power requirements.

deal to Hydro for the improvements that have taken place. We couldn't have got very far without it and I would like to associate myself with tributes paid on the occasion of its Golden Jubilee."

### Looking Forward

Mayor Harry Clark, Weston, expressed the opinion that, while fitting tribute should be paid at Jubilee celebrations to those who had launched the Hydro movement, thought should be even more prominently given to the future. His message was:

"Yesterday has gone. Today has almost gone. Let us look forward to tomorrow."

Reeve W. B. Lewis, Etobicoke Township, who represents York-Humber in the Ontario Legislature, described Hydro as the "finest publicly-owned organization in the world." He added that one of the most amazing things about it was that it was introduced by a "group of capitalists — boards of trade, manufacturers and other associations and individuals prominently associated with private industry."

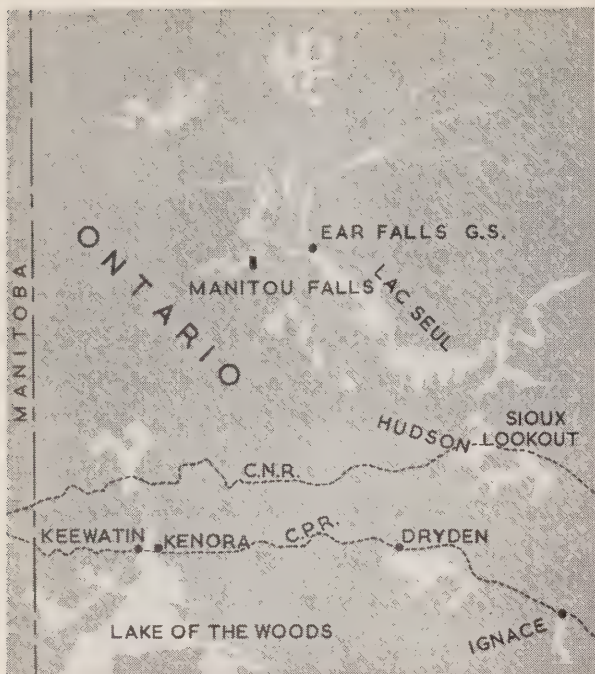
Tributes to Hydro and good wishes for successful Jubilee celebrations were expressed in addresses given by Mayor D. R. Russell, New Toronto; James Edmond, Mimico, and J. H. Doughty, a former Mayor of Mimico. — *By Harry M. Blake.*

SUPERINTENDENT Herb. Bush, left, and Chairman A. H. Waites study the first contract with Ontario Hydro signed in 1911.



G. D. ROBERTSON, Ontario Hydro, left, was noted in deep conversation with E. S. McNeice and A. F. Warner, Port Credit guests.





# NUMBER 15

## "on the line"

By W. T. Delworth

**F**ROM AN isolated cascade on the English River to a humming generating station in some 29 months!

That's the latest distinguished achievement of Hydro's construction forces at the Commission's new Manitou Falls Generating Station.

On March 29 this year, the new plant went "on the line" and three units are now in service, providing power for the mines, the mills and the growing population of north-western Ontario.

The third unit was placed in operation on May 3 and this, in key with the rest of the "Manitou story," was about 4 months ahead of schedule. During July this year the fourth unit is scheduled for service giving the station a dependable peak capacity of 54,400 kilowatts. Installation of a fifth unit was recently authorized by the Commission. The additional unit, scheduled

for service in May, 1958, will bring the Manitou plant to its full, dependable peak capacity of 68,000 kw.

### First Radio-Controlled Plant

Located in the heart of the northern forest, about 75 miles from Kenora, Manitou Falls is the fifteenth new power source brought into service by the Commission as part of the enormous postwar expansion program undertaken in 1945. In addition, the Manitou plant derives a special significance from the fact that it has been designed as the Commission's first radio-controlled station. At present, the operation of the generating equipment already in service is being supervised by Hydro personnel, but with the completion of the radio control installations, on which work is now in progress, the outflow of power from Manitou will be regulated from Hydro's Ear Falls G.S., about 17 miles upstream. This

type of remote control, involving a very high frequency radio communication system, has both efficiency and economy to recommend it. Moreover, radio control will eliminate the necessity of stationing operators in the isolated Manitou Falls area.

When the Commission authorized this new development in the autumn of 1953, Manitou Falls was simply a 25-foot drop on the English River in a virtually inaccessible part of Ontario's rugged northland. While the falls were not spectacular in terms of drop, the flow of water over them was comparable to the flow over the American Falls at Niagara. For this reason, they represented an important potential source of hydro-electric power.

Today, however, that potential has been turned into an actuality by Hydro construction crews. Where, less than two and one-half years ago, the swiftly moving waters



## Four units of Hydro's new Manitou Falls Generating Station scheduled for completion by July this year

of the English River tumbled foam-crested and white over the falls, there is now a massive concrete dam and powerhouse structure, extending 1,100 feet from shore to shore, blocking the passage of the river and turning its turbulence into electric power.

With the major portion of construction completed, everyone associated with the project can now look back with considerable satis-

*(Continued on Page 22)*

VIEW of the Manitou Falls site in October, 1953, while site investigations were underway. ▷

▷  
TODAY, after some 29 months of concentrated construction work, the lonely site in the photo, right, has been harnessed by Ontario Hydro.







DEMOLITION of two cofferdams used to dewater the powerhouse work area was proceeding when a Hydro photographer visited the project just before it was placed in initial operation.

faction on the impressive record of prodigious obstacles met and surmounted in bringing this new generating station into operation well ahead of schedule. One of the most remote power sources to be developed by the Commission in recent years, the location of Manitou Falls posed problems of communication, which had to be solved before work on the project could begin.

Overcoming transportation difficulties was the first major task confronting Hydro construction crews. In order to bring men and machinery and materials to the site of the development, some 13 miles of access road had to be cut through rocks, dense brush and the inevit-

able muskeg, to link the development site with Highway 105, near Ear Falls G.S. With work beginning late in 1953, a preliminary access road was built for use during the winter months to permit work to begin on the site as early as possible. This formidable task was accomplished in about two months and no time was lost in making a start on the project shortly after it was authorized.

#### Permanent Road

Throughout the remainder of the first winter, power shovels and trucks loaded with materials and supplies rolled over the frost-hardened access road. Meanwhile, work was in progress on the construction of a more permanent

road to replace the temporary one which, it was known, would be rendered impassable with the coming of spring. The completion of this permanent transportation and communication link meant that the first serious obstacle — the remoteness of the development site — had been removed.

Throughout the winter months of that first year, a self-contained Hydro community to accommodate the personnel employed on the project began to take shape. Some 65 acres of heavy bush were cleared to make way for the camp, which, today, offers such up-to-date facilities as a 12-bed hospital, complete with operating and X-ray equipment, a school, which can accom-





CONSISTING of corrugated metal, asbestos and enamel, a new type of building material has been used in the powerhouse walls.



THIS 10-ton gantry crane operates the emergency gates to permit dewatering of the draft tubes during turbine repairs.



TAKEN just before the plant went into initial operation, this view shows the first three units in various stages of completion.

modate 50 pupils, a recreation hall, a cafeteria capable of providing meals for about 600 people, six dormitories and other special living quarters. With such a wide range of amenities, the Manitou "village" is a far cry from the frontier pioneer community of a half-century ago.

### Temporary Channel

After access to the site and living accommodation had been established, work on the power development proper was put into full swing. A temporary channel, about 200 feet in length, had to be cut through the rock to divert the course of the river, and two cofferdams, one above the falls and the other below, had to be built to permit work on the powerhouse and dam structure to proceed "in the dry." With the completion of this preliminary work, a beginning was made on the concrete placing and steel erection for the dam and powerhouse structure.

As this, the most important phase of the whole power development neared completion, over the past few months, the wooden concrete forms were removed, revealing a row of upright concrete abut-

ments for the 11 sluiceways and the clean, modern lines of the powerhouse, which rises to a maximum height of 95 feet from bedrock to headworks. In the construction of the powerhouse, provision was made for the installation of the fifth generating unit as demands for power in the region increased.

The problems which have been solved in the construction of this station, although by no means unique in Hydro history, were thus challenging in the highest degree. In spite of the difficulties arising out of the isolated and remote location of the Manitou Falls project, work has been carried out ahead of schedule almost since the day the first bulldozers and power shovels rumbled through the silence of the bush to the site of the development. Credit for this remarkable achievement belongs, in large part, to Project Manager Pat Campbell and the construction crews working under the youngest engineering team ever placed in charge of a new power development. On May 1 this year, Mr. Campbell handed over the reins to Construction Superintend-

ent H. A. Jackson, in order to assume other duties.

### Electrical Installation

Before this important new station can be put into final operation, however, there still remains considerable electrical installation work to be done inside the powerhouse.

Coincident with the Commission's recent approval of the fifth unit at Manitou came the announcement that Hydro would proceed with another English River development at Caribou Falls, 40 miles northeast of Kenora, to provide a capacity of 75,000 kw. The first Caribou unit will be ready for operation in the latter part of 1958, it is expected.

Meanwhile construction is proceeding at the new Whitedog Falls project on the Winnipeg River, which will add 54,000 kw. to the heavily-taxed resources of north-western Ontario in 1958. At the same time plans are being made for an early start on the recently-authorized installation of a new unit at each of Hydro's Alexander and Cameron Falls plants on the Nipigon River. ■

# Golden Jubilee

# SALUTE

**Public speaking contest for Ontario  
pupils features impromptu talks on Hydro  
uses and electrical safety**



**R**ARELY has Ontario Hydro received such spontaneous praise as was accorded it on the evening of April 2 by 12 school children from widely-scattered sections of the province. Prompting this round dozen of accolades was the decision of the Ontario Public School Trustees and Ratepayers Association to honor Ontario Hydro on the occasion of its Golden Jubilee year by making its activities the subject for the impromptu section of their annual public speaking contest.

Held in conjunction with a four-day educational conference in Toronto, attended by 12,000 delegates, the contest, under the chairmanship of Mrs. Florence McCaffery, Russell, consisted of two parts: delivery of a prepared address on any desired topic, the prizes being three silver cups awarded by the association; and an impromptu address on any of three aspects of Hydro — its uses in the home, on the farm, or safety measures to be observed in its application. In recognition of the honor accorded it by the association, James A. Blay, Director of Hydro's Information Division, presented the three winners of this section with cheques on behalf of the Commission.

The 12 finalists, winners of preliminary contests held for entrants from Ontario's public schools during the year, were allowed 30 minutes to study material provided by Hydro on the three alternative choices. A representative of Hydro's Services Department was on hand during this period to answer any pertinent questions.

The note of wonderment in the clear childish voices as they exhorted their adult audience to visualize

◁  
J. A. BLAY, Hydro's Director of Information, left, congratulates Mrs. Florence McCaffery, Russell, chairman of the committee which sponsored the contest, as the winners of the Commission awards, left to right, David Pottage, Hillsdale; Carol Knox, Fergus, and Janet Rogers, Leaside, look on.



the days before electricity came to lighten man's burden — bespeaking so well the difficulty they themselves, born in an age when power and its multiple benefits are taken for granted, were having in visualizing even the pre-television era — touched a poignant chord in the hearts of many to whom such an era seems but yesterday.

### Uses Of Hydro

Most of the contestants spoke of the uses of Hydro in the home and on the farm, only two attempting the more difficult topic of its safe application. Of these, one, a 15-year-old Ojibway Indian lad from the Residential School at Kenora, showed a keen grasp of the principles of safe wiring and the dangers of circuit overloading. Perhaps the understatement of this Golden Jubilee year was made by the budding orator who, momentarily devoid of inspiration, cast a despairing look at the audience and concluded lamely — “well, you can see things must have been pretty dull before Hydro came along!”

In announcing the winners, the judges spoke highly of the quality of the speeches and manner of the youngsters' presentations. Successful contestants in the impromptu section were: first, 11-year-old Carol Knox, Grade 8, Fergus Public School; second, 12-year-old Janet Rogers, Grade 8, Rolph Road Public School, Leaside, Toronto; third, David Pottage, Grade 7, Mount St. Louis Public School, near Hillsdale. Placings in the prepared address section were: first, Janet Rogers; second, Carol Knox; third, 12-year-old Kathy Drummel-Smith, Grade 7, School Section No. 3, Dunwich.

So impressed were members of the association by the impromptu speeches of the candidates that it has since been decided to ask next year's contestants to base their prepared speeches on any of Ontario Hydro's wide variety of activities throughout the province.

The enthusiasm of the partici-

pants in this year's impromptu contest was expressed in the letter of thanks recently received by J. A. Blay, Hydro's Director of Information from Janet Rogers, 12-year-old Leaside contestant: “May I extend my sincere thanks for the gift, which I received as second prize in the

impromptu public speaking (contest). This is just another contribution which Ontario Hydro is making toward good public relations.

Thanking you again, I remain,  
Sincerely yours, Janet Rogers.”

—by J. J. Kirkwood.

FINALISTS in 1956 contest: kneeling, left to right, Michael Snelson, Lyn; David Pottage, Hillsdale; seated, left to right, Kathy Drummel-Smith, Dunwich; Mrs. McCaffery, Janet Rogers, Leaside, and Carol Knox, Fergus; standing, left to right, John Sutherland, Fort William; Norma Allewell, Dundas; Andrew Williams, Kenora; Robert Kelly, Guelph; Sharon MacDonald, Belleville; Carol Graham, Newmarket. Hydro will be main topic of 1957 contest.



# BIG BLOW

Move 60 tons of cement an hour by air pressure  
method at Hydro's St. Lawrence Power Project

EVERY hour, during concrete-placing operations at Ontario Hydro's St. Lawrence Power Project, some 60 tons of cement are being blown a distance of 1,800 feet.

Adopted by Iroquois Constructors Ltd., Hydro's powerhouse contractor, this novel method of moving one of the chief ingredients of concrete without human or vehicular transportation, will continue for the next four years.

Cement-moving is accomplished effectively — and almost inconspicuously — by means of an eight-inch steel pipe and air pressure. The pipe descends under two ship channels (the old and new Cornwall Canals) curving several times en route and finally leads into two big storage silos adjacent to the concrete-mixing plant. This constitutes a distance of approximately one-third of a mile from the source.

The only visible sign that cement is being moved into the area is the string of railway cars on a new railway siding near old Highway No. 2, west of Cornwall.

The railway cars unload directly into a screw-conveyor, beneath the siding tracks, which functions like a household meat grinder (on a much larger scale, of course). The cement is picked up by bucket conveyors on an endless chain and



By C. G. W. MacINTOSH

△ APPROXIMATELY one million cubic yards of concrete will be produced by this mammoth plant for Hydro's St. Lawrence powerhouse.

SKETCH depicts the method of blowing cement under two canals for 1/3 of a mile.





carried to the top of a storage silo, which has a five-carload capacity.

When concreting operations are in progress, the bulk cement drops from the silo into a screw conveyor, which carries it to the steel pipe, where 35 to 40 lbs. of air pressure a square inch (generated by a 200-horsepower, water-cooled air compressor) whisk it along the eight-inch passageway to the mixing plant silos near the powerhouse site.

Trained operators like Alex MacDonald, the plant operator, and Abraham Keeksnerk, operator assistant, check the pressure constantly against a "build-up" in the line because the cement makes 10 right-angle turns and ascends a total height of 50 feet during its course to the storage silos. When a "build-up" occurs, the operator immediately

cuts off the cement feeding into the line, thereby allowing the full pressure of air to blow the line clear again.

#### Avoids Traffic Congestion

The significant feature of this blowing operation is the fact that such large quantities of cement — about 1,400 bags an hour on the average — is moved rapidly and without adding more traffic to this already bustling work sector. This is a decided advantage because a great number of vehicles and much manpower would be required to keep replenishing the supply of cement if conventional methods of transportation were used. The supply is swiftly depleted during concrete-mixing and placing operations, especially when there are large "pours," which continue for several hours.

With this long pipe system, it is possible to keep the cement literally flowing in parallel with the consumption at the big concrete plant. The pipe system was scientifically designed after considerable study of the distance: the number of bends or curves required; the necessary height and the friction that would occur in an eight-inch pipe. These factors received thorough consideration in determining accurately the required amount of air pressure.

And so this cement blowing continues day after day, without "fuss or muss," as one of several integrated operations involved in the building of an important Canadian power plant.

(Mr. MacIntosh is the Commission's Information Officer, St. Lawrence Power Project.) ■



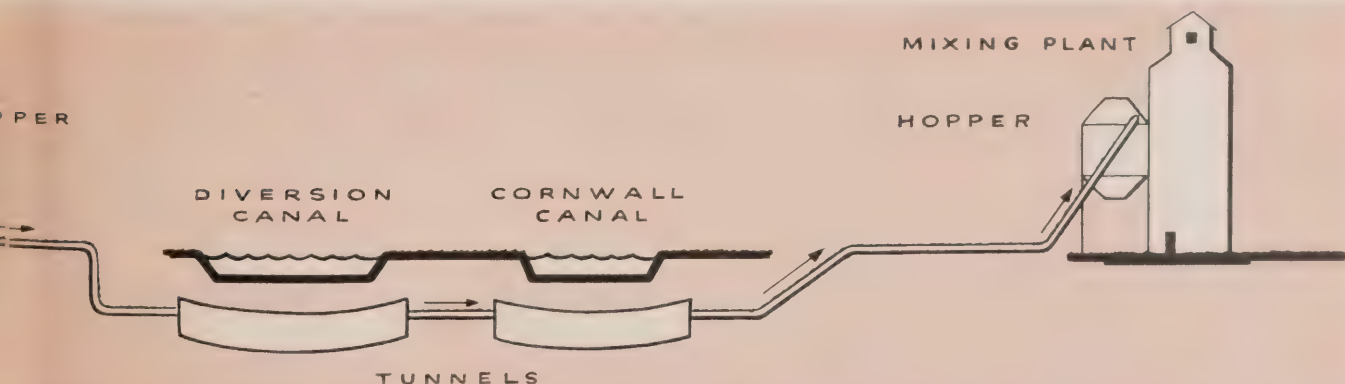
△

PUMP operator, Alex MacDonald, left, and helper, Ab. Keeksnerk watch the air pressure gauges as the bulk cement drops from the silo.



△

SUPPORTED on trestles in the open, the eight-inch pipeline dips as it enters the smaller of two tunnels under Cornwall Canal and a new diversion canal. This method of moving cement cuts down vehicular traffic in the work area.



## PUBLIC POWER PIONEER

*(Continued from Page 7)*

His son, William, describes the scene as his father came back into the office at St. Jacobs and hung up his hat.

"I have," E. W. B. Snider told his son, "just completed the biggest job I have ever done in my life."

Full of years and good works, Elias Weber Bingeman Snider died on October 15, 1921, at the age of 80. His memory and his manifold accomplishments are preserved in the report of his death in the Waterloo Historical Society Annual Report of 1921, which ends with these words:

"Replete with good acts, and of sympathetic nature, his life was an inspiration to those who knew him best; and to a wider circle it was the mainspring of a prodigious interest in behalf of the public." ■

We wish to acknowledge the kind assistance of C. B. Schmidt, Managing Editor of the *Kitchener - Waterloo Record*, for his courtesy in providing some of the photographs appearing with the above article.

—Editor's Note.

## ANOTHER STEP

*(Continued from Page 13)*

A prediction of great significance for both Hamilton and Ontario Hydro was made by Dr. Hearn in his address. Referring to the fact that the West Central Region is the only one in the Hydro organization whose boundaries do not embrace any sources of electrical generation, apart from the small plant at the Steel Company of Canada, which Hydro uses only occasionally, the Chairman added:

"This is likely to change, however, due to the growing need for more fuel-electric generation as our hydro-electric resources are fully utilized. As Mr. Warrender, our Vice-Chairman, and I have indicated recently, Hamilton is almost sure to be the

site of our next major thermal station, possibly to the extent of one million kilowatts."

Turning to the Commission's regional organization, Dr. Hearn briefly recounted the steps in Hydro's decentralization program.

"It is just nine years ago that the decision to decentralize was made," he said, "and I think it significant that Hamilton, the hub of one of Ontario's most productive areas, is the site of the first of the new offices planned for several of our regions."

Dr. Hearn went on to express his personal appreciation of the sterling work of Mr. Russell, West Central Regional Manager, and his staff in serving the Commission's customers in the area.

"I sometimes wonder," the Chairman reflected, "if everyone realizes the importance of the regional office and how it affects the individual customer. In addition to administering the work of Hydro in its area, the regional office is also able to guide the policy of Ontario Hydro in regard to its relations with the public. The experience of the last eight years or so has proved that this works to the benefit of us all."

Dr. Hearn then introduced Hon. William K. Warrender, Vice-Chairman of Ontario Hydro, and a native Hamiltonian.

"It is deeply gratifying to me personally," said Mr. Warrender, "to take part in this event in my home town and among fellow citizens, whom I am privileged to serve in the Ontario Legislature."

The Vice-Chairman outlined briefly the history of the West Central Regional Office, explaining that it is one of nine regional offices strategically located in various parts of the province.

"These offices were set up in 1947," continued Mr. Warrender, "as a direct result of the Commission's tremendous expansion program, which was geared to meet the mounting power needs of a province on the march."

"Within this region alone, there are some 58 Hydro cost-contract municipalities, one Commission-owned local system, 13 rural operating areas and 15 direct industrial customers. In 1947, there was a total of 166,935 customers of all classes in the region and by the end of 1955, this figure had jumped to 235,580 — an increase of 41 per cent."

Mr. Warrender also pointed out that the use of power is an accurate barometer of industrial and economic growth. When the regional offices were established in 1947, he said, the sum of customers' peak loads in the West Central Region totalled 370,157 kilowatts. This figure reached a total of 646,207 kilowatts by the end of last year, showing an increase of 75 per cent.

"As Mr. Russell and his staff move into these fine new quarters," concluded the Vice-Chairman, "I am sure they must all be deeply conscious of the part each has to play in serving the people of this section of Ontario."

## Cutting The Ribbon

Mr. Russell thanked Dr. Hearn and Mr. Warrender for their speeches on behalf of himself and his staff. Dr. Hearn then stepped forward to officially open the building.

"It is appropriate that we should be opening, in this Golden Jubilee year of Ontario Hydro," said the Chairman, "the new office of the West Central Region, serving the area in which those men of vision back in the early part of this century laid the foundation for one of the greatest organizations of our time — your Ontario Hydro which serves you through this office."

Loud applause accompanied the subsequent cutting of the ribbon.

Lt.-Col. Newman dedicated the building to the service of the people. Other dignitaries were introduced, some of them speaking briefly. Following "O Canada," refreshments were served to conclude this memorable event. ■





△

FROM the base station located at Hydro's main rehabilitation centre in Morrisburg, Ont., Operator Joan Hamilton sends out an urgent message to one of the radio-equipped vehicles.

LIKE many of the mechanical marvels and ingenious devices being used in the St. Lawrence Seaway and Power Project, mobile telephones were unheard of when the development was first contemplated, but today they are playing an important part in the vast undertaking.

Mobile telephone service, which permits two-way radio conversations between vehicles on the road, or between vehicles and stationary telephones, is proving valuable wherever "time is money."

The service is being used by the St. Lawrence Seaway Authority, contractors working on the St. Lawrence Power Project and is also being employed by Ontario Hydro as an aid in the Commission's rehabilitation work in Seaway Valley.

Engineers of the St. Lawrence Seaway Authority, who are conducting a hydrographic survey along the seaway route between Montreal and Cardinal are using Bell Telephone's private radio-telephone service in an unusual way. In each survey team, one group of engineers takes soundings from a boat in the river channel, while another group works on each bank. All these groups keep in touch and co-ordinate their findings by means of radio-telephone. The Authority is using 14 mobile telephones in this work.

Bell technicians have installed mobile telephone equipment in nine station wagons and cars being used by the staff of Hydro's rehabilitation centre at Morrisburg. A "base station" has been installed in the centre. The two-way radio system provides rapid communication between the centre and the field men, who are co-ordinating the relocation of whole communities, which are destined to be inundated when the project is completed.

The task of rehabilitating some 6,500 people in such communities as Iroquois, Morrisburg, Aultsville, Farran's Point, Dickinsons Landing, Wales, Moulinette and Mille Roches will involve thousands of miles of travelling by those who are responsible for preparing new town sites,

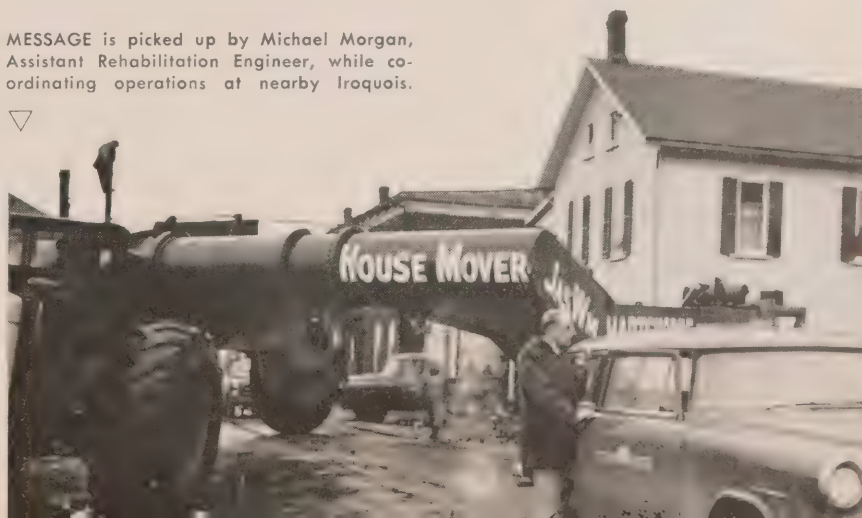
Two-way mobile telephones for Hydro's St. Lawrence rehabilitation staff expected to reduce mileage and save time

installing utility services and moving homes and families from the area to be inundated, but the use of mobile telephones is expected to reduce this mileage and save many hours of valuable time.

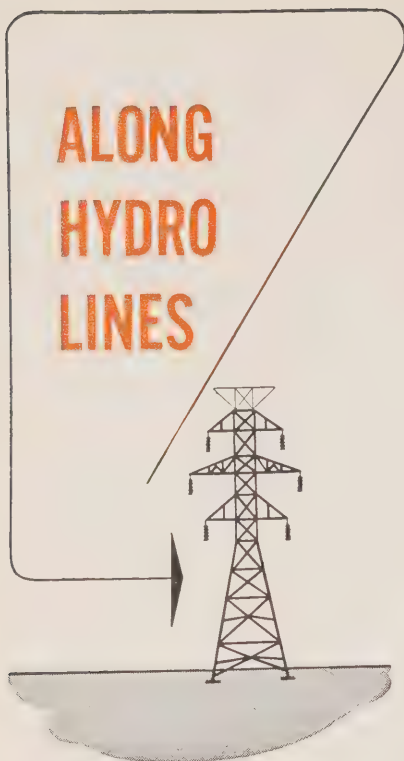
One firm specializing in servicing the massive construction equipment working on the seaway and power project has a mobile unit installed in a service truck. The set is linked by radio to the company's seaway headquarters. This system enables the service crews to spend more of their time on the job, and less in travelling from their work to headquarters for further instructions. In many cases the servicemen can put one machine back into action and proceed directly to another in need of a part or some minor repair. ■

MESSAGE is picked up by Michael Morgan, Assistant Rehabilitation Engineer, while co-ordinating operations at nearby Iroquois.

▽



## W. R. CATTON RETIRES AT BRANTFORD



### Eastern Region Accidents Drastically Reduced

Annual accident rate among the Commission's Eastern Region employees shows a substantial reduction from 4,115 lost-time days to 65 lost-time days in the past five years, excluding fatalities. These and other statistics were presented to the fifth annual Eastern Region Safety Conference in Ottawa by Regional Safety Officer G. R. Shannon.

When the program was started in 1951, lost time, through accidents, was a serious factor, but education, engineering and enforcement have cut the lost time to an almost negligible figure.

### Windsor U.C. Workers Receive Pay Increases

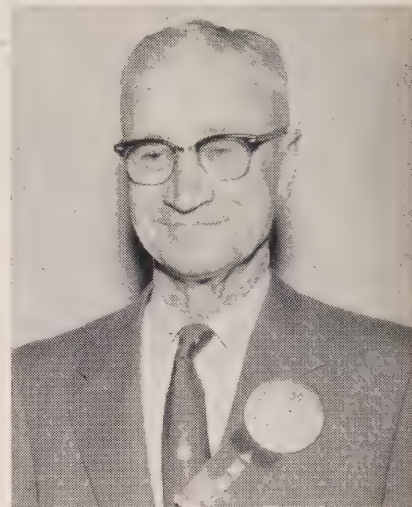
Water and Hydro employees of the Windsor Utilities Commission have received wage increases averaging seven cents an hour, following agreements negotiated by General Manager J. E. Teckoe, Jr. and Locals 1529 and 911 of the International Brotherhood of Electrical Workers.

A MAN who has identified himself with the growth and development of the City of Brantford for more than 40 years, W. R. Catton retired on May 1 from the staff of the Brantford Public Utilities Commission. Known throughout Ontario and wherever members of the profession gather as an "engineer's engineer," Mr. Catton relinquished his duties as Manager of the Brantford utility last year being succeeded by Norman A. Grandfield, Galt, as General Manager in October, 1955. Since that time Mr. Catton has acted as Manager of the Hydro Department of the Brantford Commission.

Born in Burford, Ont., Mr. Catton started his Hydro career with Ontario Hydro in 1910, working in the Commission's Operating and Engineering Departments until 1914, when he became Superintendent of the Brantford P.U.C. The Manager of the Brantford Commission at that time was L. G. Ireland. When Mr. Ireland left Brantford in 1916 to take an important post with Ontario Hydro, Mr. Catton was appointed to succeed him.

A man of strong and warm personality, Mr. Catton was endowed with an intense curiosity and a natural ability to get to the root of problems. It was through this ability that he became, in fact, a self-trained engineer; so much so that he was a welcome addition to the membership of such organizations as the Association of Professional Engineers of Ontario.

When Mr. Catton assumed the manager's chair at Brantford, the local commission's load was little more than 2,000 kilowatts. Much of the development of Hydro and, indeed, of Brantford, since those early days can be attributed to the increasing availability of electrical power and to the personal touch



W. R. CATTON

with which Mr. Catton guided the affairs of the local system. He always worked in close association with the commission's customers and is generally given credit for persuading new industries to locate in Brantford and for influencing existing plants to enlarge their services.

The general growth of Brantford during Mr. Catton's tenure of office is indicated by the fact that the peak load supplied to the Brantford P.U.C. by Ontario Hydro in 1955 totalled 37,023 kilowatts — a tremendous increase over the 2,056 kilowatts supplied about the time he assumed the managership. This increase was paralleled, down through the years, by the expansion of the city itself, both in industry and in population.

When Ontario Hydro purchased the Western Counties Electric Company in 1930, Mr. Catton played an important part in amalgamating the local facilities of that company after they were taken over by the Brantford Commission. The amalgamation necessitated the conversion of the purchased system from 66-2/3 cycles to 25 cycles. In the past few



years, Mr. Catton has been actively associated in another standardization operation — that of changing over the Brantford system from 25 cycles to 60 cycles in conjunction with Ontario Hydro's Frequency Standardization program.

While he is well-known as an engineer, Mr. Catton is also a proficient golfer, a fisherman and pheasant hunter of wide repute. His treks to the pheasant-hunting grounds have been so successful over the past 15 years that the return of the hunter annually signalled a gathering of many of Mr. Catton's friends throughout the province for the now famed "Catton pheasant dinner."

Mr. Catton was active for many years in the affairs of the O.M.E.A. and the A.M.E.U., and was President of the latter organization in 1934. His retirement as Manager of the Brantford P.U.C. marks the active end to a Hydro career that has spanned the years from the "horse and buggy" days of the 1900's to the beginning of the Atomic Age. With him, he takes a host of friends; behind, he leaves a monument, which he has done so much to shape — the tangible and intangible assets of the Brantford P.U.C.

#### **N. A. Grandfield**

Mr. Grandfield's new duties in-



**N. A. GRANDFIELD**

clude management of the city's transportation system, in addition to those of the Hydro and Water Departments.

Mr. Grandfield — or "Norm" as he is known to a wide circle of friends — was Assistant Hydro and Waterworks Manager at Brantford for four years prior to his Galt appointment in 1951. In Galt, Mr. Grandfield guided the city utility through a busy and challenging period, which witnessed 60-cycle changeover, a major annexation and considerable plant expansion.

In the spring of 1952, Mr. Grandfield became Vice-President of the Association of Municipal Electric Utilities, taking over as President the following year.

While in Galt, he was a member of the Galt Kiwanis Club and took a considerable interest in community affairs. He was appointed in 1954 to the Western Ontario Water Resources Committee, a group formed to investigate further possible water supplies in that section of the province.

Born in Somerset, England, Mr. Grandfield came to Canada at an early age. He graduated as an electrical engineer from Queen's University in Kingston, then served as a lieutenant in the Royal Canadian Navy. Prior to his first Brantford appointment in 1947, he was employed in Toronto by Ontario Hydro. ■

#### **St. Catharines P.U.C.**

##### **Doubles Budget**

Expenditure of more than one million dollars in the next three years to keep pace with system requirements was predicted by Manager Ray Pfaff at a recent special budget meeting of the St. Catharines Public Utilities Commission. Not only is consumption increasing, but the rate of increase is becoming greater, he told the commission, which, after careful consideration, approved a 1956 budget of \$541,000 — more than double the 1955 budget.

#### **James Brandie Dies At Bothwell**



**JAMES BRANDIE**

James Brandie, 84, Bothwell Hydro Commissioner, died March 21 this year after a brief illness.

Prominently identified with the civic administration of Bothwell for almost four decades, Mr. Brandie had an enviable record of 22 consecutive years' service (1934-1956) on the Bothwell Commission.

He also served on the Bothwell School Board for 6 years (1919-24); on the municipal council for a similar period (1925-1930) and as Mayor of Bothwell for two years (1931-32). He was a Justice of the Peace for the community for 21 years.

Actively interested in church and fraternal work, the deceased was affiliated with the C.O.F. Lodge.

#### **Stratford Retains "Utility" Title**

Stratford Public Utility Commission is to remain the official title of that body. Because it is sometimes referred to as the Stratford Public Utilities Commission, the question of the singular or plural was discussed at recent meeting. Advised that the official charter, dated 1915, combined the utilities of that day into one utility, commissioners decided that the singular title should stand.

#### **Ajax Council Buys Local Hydro System**

Citizens of Ajax, Ontario (between Whitby and Toronto), have approved by 335 votes to 49 the purchase of the local Hydro system and by 345 votes to 33 the issuance of debentures to finance the purchase.

Following this decisive endorsement, the Ajax Council took over the system from Ontario Hydro on May 1, 1956.

## F. H. CHANDLER APPOINTED DIRECTOR OF ENGINEERING

**G.** D. FLOYD, Assistant General Manager, Engineering, has announced the appointment of F. H. Chandler as the Commission's Director of Engineering.

Mr. Chandler succeeds J. R. Montague, who retired from the position on April 1 to assume new duties as Consultant to the Chief Engineer. Mr. Montague, who has served with the Commission for 35½ years, has given, as Mr. Floyd stated, "loyal and distinguished service and has contributed immeasurably towards the development of the Commission's resources throughout the province." Active in the affairs of the Association of Professional Engineers of Ontario, Mr. Montague was President last year.

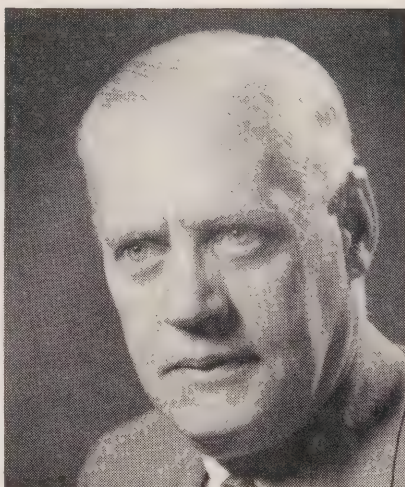
### F. H. Chandler

Mr. Chandler, who was born at Stratford, Ontario, received his primary and secondary education in that city. After 18 months as a reporter on the *Stratford Beacon-Herald*, he entered the University of Toronto, graduating with a B.A.Sc. degree in electrical engineering in 1915.



J. R. MONTAGUE

First associated with Canadian Westinghouse Ltd., Hamilton, in



F. H. CHANDLER

1915 on this company's test course he joined the army and in 1918 came to the Commission as an Assistant Engineer to A. H. Hull. His first major assignment was the installation of the third unit at Eugenia G.S. Work on the engineering and design of all types of stations throughout Ontario followed until 1943, when he was appointed Stations Engineer. He occupied that position for a period of 10 years until he was named Assistant Director of Engineering.

Active in electrical and other associations, Mr. Chandler is a Past President and life member of the Electric Club of Toronto; a member of the Association of Professional Engineers of Ontario; the American Institute of Electrical Engineers, and serves on committees of the Canadian Electrical and the Canadian Standards Associations.

A member of a well-known "Hydro" family, Mr. Chandler is a brother of Ralph B. Chandler, who retired in 1954 after some 20 years' service as Manager of Port Arthur P.U.C. A nephew, R. W. Chandler (son of R. B. Chandler), is associated with Hydro's Generation Department as Project Design Engineer. ■

## PATHWAYS TO POWER

(Continued from Page 17)

openings in connection with turbine flow measurement.

Model No. 8 depicts the Iroquois dam and vicinity, on a scale of 1 to 80, to determine hydraulic conditions and performance at various stages of construction. It will be used to obtain calibration of the dam and to study operation of the 32 gates.

A ninth model, constructed on a scale of 1 to 80 vertically and 1 to 160 horizontally, will, when completed, be used in studies relating to the St. Lawrence powerhouse tailrace excavation.

Through the use of the St. Lawrence models, it is already indicated that savings will be obtained on the St. Lawrence power development in excess of those achieved on the Niagara project. Thus, it may be safely stated that hydraulic model studies have truly become a valuable engineering tool. ■

### J. J. JEFFERY



J. J. JEFFERY

An engineer with the Commission for 38 years and well-known to representatives of the Ontario municipal electrical utilities, John James Jeffery died in Toronto recently after a lengthy illness.

Born in Toronto, Mr. Jeffery and his twin brother, R. T. Jeffery, were educated at Owen Sound Collegiate, graduating in engineering from Queen's University, Kingston, in 1908. Joining the staff of Ontario Hydro in 1913, Mr. Jeffery served as assistant to his brother, who held the post of Chief Municipal Engineer for several years. They retired in 1951.

A member of the Association of Professional Engineers of Ontario, the Electric Club of Toronto and other organizations, Mr. Jeffery is survived by his wife and brother, as well as a son, J. W. Jeffery, Thornhill.



## Residents Favor Wales As Name For New Town

Residents of the Ontario communities of Aultsville, Farran's Point, Dickinsons Landing, Woodlands and Wales, which will be affected by the raised water level of the St. Lawrence River when the seaway and power developments come into operation, have chosen "Wales" as the official name of their new municipality, hitherto designated as "New Town No. 1." At a recent plebiscite, the residents favored the name "Wales" by a margin of 30 votes over "Kanata" — an Indian word meaning "collection of huts," from which the name Canada is derived. With a vote of 240 to 210 for the above names, only 40 residents registered their preference for "Osnabruck," a name brought over by the first German settlers in the district.

Official approval of the Post Office Department will be necessary before selection of the name "Wales" becomes final.

## Named Consumer Service Engineer

Kenneth N. Bodkin has been appointed Consumer Service Engineer of Hydro's Northwestern Region with headquarters at Port Arthur.

Born at Delaware, Ontario, Mr. Bodkin was educated at Delaware Continuation School and at London South Collegiate. For several years he served as a lineman with Ontario Hydro. Resuming his education, although still continuing as a lineman during summer vacations, Mr. Bodkin graduated from Queen's University in electrical engineering in 1939. From 1940 to 1942 he served as Area Manager at Lucan.

He held the rank of Lieutenant in the Canadian Army from 1942 to 1946, being appointed an Assistant Municipal Engineer at Head Office in Toronto on demobilization. In 1947, with the establishment of nine regional offices, Mr. Bodkin was named Consumer Service Superintendent for the Northwestern Region, moving to Port Arthur in 1948.



## "FOR MERITORIOUS SERVICE"

**P**ALMERSTON Public Utilities Commission recently sponsored a "family" dinner party for members of the Commission and staff to honor Miss Mae Phillips, who was retiring after 32 years' service with the utility. Brief addresses were given by Chairman Archie McGugan, Manager S. J. McEwan, Mayor Sam Wald and Commissioners J. Fred Edwards and T. D. McLaughlin, who paid tribute to the unique and enduring contribution Miss Phillips had made to the growth of Palmerston by her efficient handling of the duties of utility accountant. In the presentation, which followed, Mr. Edwards presented Miss Phillips with a framed citation "for meritorious service" while Mr. McLaughlin tendered a suitable gift to the retiring employee. Miss Phillips, in reply, recalled that she had been associated with nine utility managers from the time she joined the commission staff in 1924.

In the photograph above, she is shown with, left to right: Commissioners J. C. Forster, J. F. Edwards, Chairman McGugan, T. D. McLaughlin and Mayor Wald, as the citation was formerly presented.

## Sandwich West Appoints Manager

David H. Pope, formerly Area Supervisor in Ontario Hydro's London Area, has been appointed Manager of the newly-formed Sandwich West Hydro-Electric Commission. Mr. Pope has been with Ontario Hydro in the Western Region since 1949 and has had considerable experience in consumer service work and area operation. In 1953 he handled the operation of Amherstburg P.U.C. during the prolonged illness of the manager of that utility.

The Municipality of Sandwich West took over the operation of the distribution system within its boundaries from Ontario Hydro's Windsor Area on March 1, 1956. The

municipality has signed a contract for a supply of power with Ontario Hydro dated February 1, 1956. This action on the part of the township was authorized by a vote of the electors in December, 1954.

Mr. Pope will be responsible for hiring and training a full staff of employees to handle a utility with approximately 5,000 customers. It will also be necessary to locate and equip suitable accommodation for office, stores and service centre facilities.

## St. Catharines P.U.C. Names Superintendent

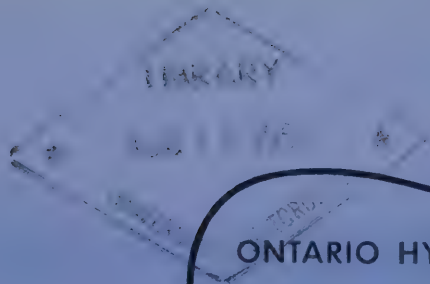
Vernon A. May has been appointed superintendent of the St. Catharines Public Utilities Commission, replacing George Sweatman, who has retired.



OPERATED BY remote control from Cameron Falls Generating Station, Hydro's Alexander Generating Station, situated 1½ miles downstream on the Nipigon River (as shown in the photograph below) has made a notable contribution to the development of northwestern Ontario in the past quarter-century. Highlighting the Hydro Golden Jubilee celebrations this year, the Commission recently approved the installation of one additional unit at each of the above stations (totalling 31,500 kilowatts). This announcement recalls the gradual expansion of the Alexander plant. The inset photograph shows construction under way in 1930 for the initial phase, which included the installation of three generating units (completed in 1931). A fourth unit was added in 1945. Work on the fifth unit is scheduled to start in the near future.







ONTARIO HYDRO

# News

JUNE, 1956



IN THE MEMORY OF  
AS WEBER BINGEMAN AN IDEAL  
RECOGNITION OF HIS SERVICES  
MAKING ONTARIO PUBLIC POWER  
HYDRO A BETTER PLACE TO LIVE  
JANUARY 1956



TRIBUTE TO A  
PUBLIC POWER PIONEER.

# ONTARIO HYDRO

PUBLISHED BY THE HYDRO-ELECTRIC  
POWER COMMISSION OF ONTARIO  
520 UNIVERSITY AVENUE, TORONTO



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## POWER AND THE FUTURE

**H**YDRO's Golden Jubilee celebrations this year, commemorating 50 years' service to the Province of Ontario, vividly emphasize the truly remarkable increase in the use of electric energy by industry and every type of customer during the past half-century.

Even the most ardent proponent of a publicly-owned electrical system in 1906 would have considered it imprudent to predict that the Commission's total dependable capacity would grow from a mere 7,400 kilowatts in 1910 (the year in which Hydro started to supply power to several of the 14 original municipalities) to more than 4.5 million kw. (including generated and purchased power), within 50 years. Moreover, they would have considered it highly improbable that the customers of Ontario Hydro would increase their demands from approximately 4,000 kw. in 1910 to a figure in excess of 4.2 million kw. in less than five decades.

This phenomenal increase in supply and demand reflects the dynamic influence of electricity on the development of the province in the past 50 years. Simultaneously it underlines modern man's absolute dependence on this form of power, and the fact that a stoppage of the even flow of this energy would strangle the economy of Ontario.

Addressing delegates at the recent annual meeting of the Ontario Mining Association, Hydro Chairman Dr. Richard L. Hearn stressed the paramount urgency of discovering and developing new means of producing electric power. Dr. Hearn drew attention to the fact that the world's population is increasing at the rate of about 20 million a year (the population of Canada and United States is growing at the rate of two million a year or about 6,000 a day). Thus industry, in the next half-century, will be called upon to support "a vastly-increased population," while the fossil fuels—coal, oil or gas—and natural sources of energy, such as water, are being depleted at an accelerated rate.

Expressing the view that nuclear energy would provide an answer to this problem long before other sources of energy, such as the sun, Dr. Hearn took the opportunity to emphasize the far-reaching implications of the Commission's participation in the joint plan with Atomic Energy of Canada Limited and the Canadian General Electric Company Ltd. to build the Nuclear Power Demonstration station at Des Joachim's. The Hydro Chairman's appraisal of this important project clearly indicated that the Commission, as Canada's largest electrical utility, is keeping abreast of developments in the nuclear power field, particularly in Great Britain and United States.

This demonstration station will provide experience in planning for nuclear-electric stations of 100,000 kw. capacity or more, Dr. Hearn stated, indicating his confidence that nuclear power at considerably reduced cost will be "economical for base load operation by 1965."

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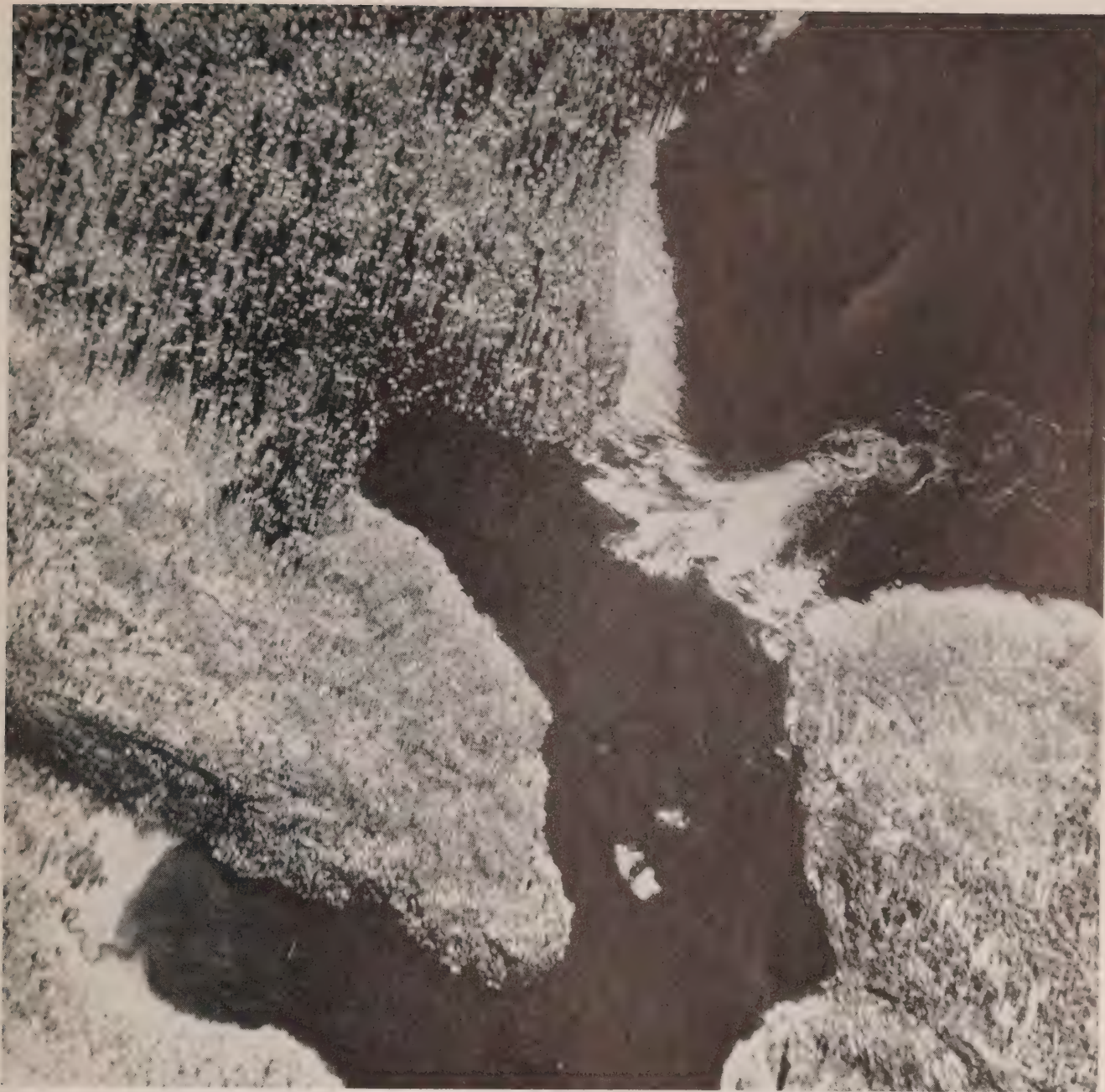
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## COVER SHOTS

**D**EDICATED on May 14 this year, the monument depicted on our front cover this month preserves the memory of E. W. B. Snider, of St. Jacobs, Ontario, one of the pioneers who spearheaded the Hydro movement in Ontario. Admiring the monument is Mrs. D. B. Detweiler, Kitchener, widow of D. B. Detweiler, another "Hydro pioneer" (see page 12), Hon. Louis O. Breithaupt, Lieutenant-Governor of Ontario and W. W. Snider, only surviving son of "E. W. B." Full details of this ceremony will be published in a special Golden Jubilee edition of *Ontario Hydro News*.

The back cover traces two important events associated with Ontario Hydro's development of the power resources of the Niagara River.





## POWER FROM "THE CARIBOU"

**W**ITHIN the next 2½ years, this picturesque waterfall on the English River will have been transformed by Ontario Hydro engineers into another important source of hydro-electric energy to serve the growing industries and population of northwestern Ontario. Located only eight miles from the Manitoba boundary, 40 miles northwest of Kenora, Hydro's new Caribou Falls Generating Station will, it is anticipated at present, come into

initial service in December, 1958, while its total capacity will be 75,000 kilowatts in three units. Situated some 85 to 95 miles downstream from two other Hydro generating stations on the English River at Ear Falls and Manitou Falls, this new power project will feature a 1,700-foot main dam, which will raise the level of the English River on an average of 45 feet above its present level for a distance of some 35 miles upstream.



# **GOLDEN JUBILEE**

***Ontario Government Tenders Dinner Marking  
Hydro's 50 Years of Service to the Province***



ONTARIO HYDRO NEWS



# SALUTE



EXPRESSING Hydro's gratitude to the Ontario Government, Chairman Dr. Richard L. Hearn, left, presented a large oil painting of the St. Lawrence Power Project to Prime Minister L. M. Frost, shown with the artist, Otto Grebze, right.



SOME 800 guests, including members of the Ontario Legislature, civic officials and representatives of the Ontario and municipal Hydro Commissions attended the dinner.

"AT THIS time we acknowledge the ideas and courage of a handful of individuals and municipalities of half a century ago, and we extend to Hydro our congratulations on the accomplishments of the past and our confidence in the ability of this great organization to meet the challenging demands of the future."

This salute from Hon. Leslie M. Frost, Prime Minister of Ontario, set the keynote for many enduring tributes to Hydro from Premier Frost and members of his cabinet on June 12 this year.

The occasion was a complimentary dinner tendered by the Ontario Government as an official observance of Hydro's Golden Jubilee year.

Hon. W. K. Warrender, Q.C., who presided as Chairman of the event, remarked that he regarded his role as a plural honor, in that he was present as Vice-Chairman of Ontario Hydro and a member of the Ontario Cabinet, thus being at once both guest and one of the hosts. Mr. Warrender presided over a gathering of some 800, including civic, as well as Ontario and municipal Hydro officials, a group of Ontario Hydro pensioners

and representatives of the press, radio and T.V.

The toast to Ontario Hydro was proposed by Hon. Dana Porter, Provincial Treasurer, with Dr. Richard L. Hearn, Chairman of the Commission, replying. Greetings were extended by Gordon Fuller, President of the Ontario Municipal Electric Association and E. A. Washburn, President of the Association of Municipal Electrical Utilities.

Premier Frost, who was accorded a standing ovation as he rose to speak, described Hydro as "the largest integrated electric supply utility in the world" and in outlining its early history he brought to light some interesting information. He said that Hydro's development came from two directions — from activities on the part of the municipalities and from proceedings within the Ontario Legislature. In referring to the role of municipal representatives in the Hydro movement, he paid tribute to such Hydro pioneers as Daniel B. Detweiler, E. W. B. Snider and Sir Adam Beck, whom he acknowledged as the men who had originated the idea of public ownership and distribution of water-generated power.

## Early Hydro Projects

Turning to the history of the important public enterprise at the legislative level, Premier Frost re-

*(Continued on page 4)*



RECEIVING the applause of the large Golden Jubilee gathering, this group of 48 Ontario Hydro pensioners, with a combined service record of more than 1,800 years, were among the guests at the dinner.

called a development in his birthplace, Orillia, where, as early as 1899, the town had asked for the authority to borrow \$75,000 for the purpose of installing a power plant on the Severn River. The proposal involved the transmission of power for a distance of about 18 miles from the site to the town. Andrew Miscampbell, then member for East Simcoe and, incidentally, Mr. Frost's godfather, introduced the bill and guided it through to acceptance in spite of opposition to the principle of public ownership. Subsequently, in 1902, Mr. Miscampbell introduced into the Budget debate in the form of an amendment, the first Hydro resolution.

Among other recommendations the resolution proposed "that in the opinion of this House, the waters of the Niagara River and its tributaries, as well as the water of other streams, where necessary, should, at the earliest moment and subject to existing agreement, be utilized directly by the Provincial Govern-

ment in order that the latter may generate and develop electricity and pneumatic power for the purposes of light, heat and power, and furnish same to municipalities at cost." In addition to this far-sighted resolution, Mr. Miscampbell suggested that Niagara power be utilized to develop the great nickel deposits in the Sudbury area. This, Mr. Frost remarked, must have seemed far beyond the bounds of realism when it was then being argued that 100,000 horsepower could not be transmitted from Niagara to the Kitchener area without endangering human life.

The Prime Minister then told his audience of a Throne Speech delivered four years later, which must also have been regarded as a gross over-statement. The speech included this statement: "It is impossible to overestimate the great advantages that will accrue to all kinds of industries and developments that will ensue from the general application of electric power at reasonable

rates. On all hands it is agreed that it means to the Province of Ontario an industrial revolution."

Time had proved the veracity of these statements, the speaker stated, pointing out that power generated at Niagara had, on occasion, reached Sudbury. "Furthermore," Mr. Frost continued, "the formation of Hydro did create in Ontario an industrial revolution to the extent that this province, without coal resources, has water-generated power available for industry almost to its farthest reaches. It has meant that industry and development could take place in almost any part of the province. This great idea is the fundamental basis of the mighty industrial expansion of Ontario today."

#### Special Tribute

Mr. Warrender, in his capacity as Master of Ceremonies, extended a special greeting to a representative group of 48 Ontario Hydro pensioners, with a combined service



record in excess of 1,800 years, attending the event. He also made special mention of "the succession of dedicated men who have served on the Ontario Hydro Commission and on the municipal Hydro commissions over the years."

Proposing the toast to the Commission, Hon. Dana Porter, Q.C., Provincial Treasurer, noted that June 12 was a particularly appropriate day upon which to honor Hydro. He explained that it was on this day in 1903 that the Ontario Government passed the act which provided for the construction of municipal power works and the transmission and distribution of power. He paid tribute to the entire Hydro family "for a job magnificently done." During the next quarter-century Hydro expected to generate more than six times as much power as it was now generating after 50 years of progress.

"We are confident that Hydro will continue to lead the way in the future as it has in the glorious past," he concluded.

In reply to the toast, Dr. Hearn, on behalf of his colleagues on the Commission and the staff of Hydro, expressed appreciation to the Ontario Government. As a token of gratitude, Dr. Hearn presented Premier Frost with a painting of the St. Lawrence Power Project executed in oil by Otto Grebze, a Hydro staff member. As a matter of interest, he pointed out that the artist had come to Hydro from Latvia in 1947 as a construction worker at the Des Joachims project. He had since completed a great many similar works of art. "We are proud to regard him not only as a very fine new Canadian, but as a talented and gifted artist," Dr. Hearn said. The Prime Minister gave his assurance that the painting would find an honored place in the Parliament Buildings at Queen's Park.

Gordon Fuller, President of the O.M.E.A., stressed the excellent co-operation existing between his organization and the Ontario Hydro

Commission. He said it was stronger than ever as a result of the appointment to the Commission of A. A. Kennedy, Immediate Past President of the O.M.E.A.

Briefly outlining the function of the A.M.E.U., founded in 1909, E. A. Washburn, President of the A.M.E.U., referred to it as an "authoritative body in Canada, recognized for its work throughout the electric utility industry. Its collective operation is based on co-operation and trust."

Civic greetings were tendered by Frederick Gardiner, Q.C., Chairman of the Toronto Metropolitan Council, on behalf of the 13 municipalities and almost 1½ million people living in the Toronto area.

Dinner guests were granted an insight into the more personal aspects of the character of Sir Adam Beck, first Hydro Chairman, by a man whose acquaintance with the "Father of Hydro" was on a "next-door-neighbor" basis. E. V. Buchanan, former General Manager of the London Public Utilities Commission and a close friend of Sir Adam, described him as a most generous man, who had the ability to inspire confidence in others, but who was frequently misunderstood by his associates. So devoted was he to the Hydro cause that he had neglected his own interests and had died a relatively poor man.

The evening also had its lighter moments. Alex Barris, theatre critic of the *Toronto Globe and Mail* presented entertainment, which included a sing-song and a barbershop quartet called "The Townsmen." Even the song repertoire harked back a half century in keeping with the occasion. The "emcee," as Professor "Alexsky Barrisky," concluded his offerings with a simple, down-to-earth explanation of the operation of a nuclear power plant. Complete with slides and some fascinating diagrams, his learned discourse left the audience with an interesting conception of nuclear fission.

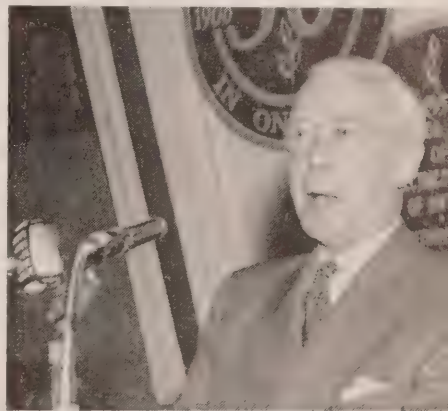
—by Don. G. Wright.



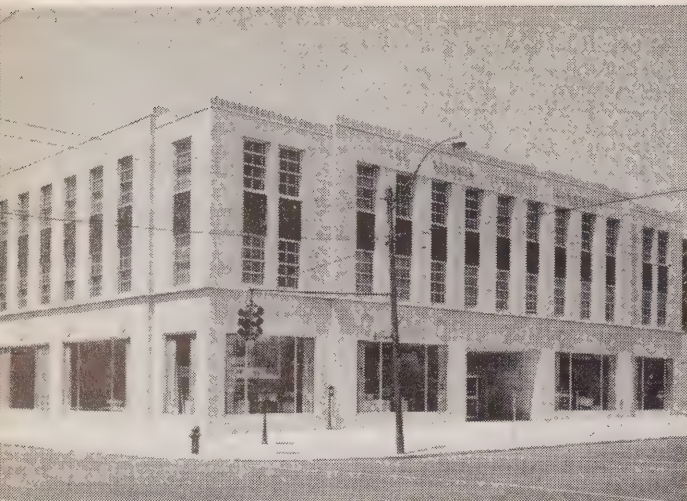
VOICING confidence in the Commission's leadership, Hon. Dana Porter, Q.C., Provincial Treasurer, proposed the toast to Hydro.



IN HIS dual capacity as Minister without Portfolio, Ontario Government, and Hydro Vice-Chairman, Hon. W. K. Warrender, Q.C., ably fulfilled the role of dinner Chairman.



A PERSONAL FRIEND of the late Sir Adam Beck for many years, E. V. Buchanan, retired General Manager, London P.U.C., provided several interesting reminiscences of the vigorous character of Hydro's first Chairman.



MAIN entrance of Windsor's new utility building faces on Ouellette Avenue, the city's main thoroughfare.

# FACING

## WINDSOR UTILITIES COMMISSION

### DEDICATES NEW HEADQUARTERS

**W**INDSOR Utilities Commission celebrated a significant milestone in its long and useful history on May 24 this year with the formal opening of its new and handsome headquarters.

Built at a cost of some \$750,000, including furnishings, the three-storey structure occupies a dominant position in Windsor's expanding commercial area.

Combining both the Hydro and water divisions of the progressive utility, the new building, with its tasteful Queenston limestone exterior, offers utility customers convenient facilities for payment of accounts or viewing of appliance displays.

#### Main Business Office

Decorated in cool pastel shades and provided with the latest type of lighting fixtures, the spacious main floor includes the general business office and an attractive display and sales room for electrical appliances.

A passenger elevator in the central section of Windsor's most modern building, permits easy access to the

other floors. The offices of the General Manager and the Secretary-Treasurer, the board room, and the billing room are located on the second floor.

A conference room, the office of the Assistant General Manager, as well as ample accommodation for the engineering staffs of both the Hydro and water divisions occupy the third floor.

With Chairman Malcolm J. Brian as Master of Ceremonies for the recent official opening, the brief ceremony was attended by officers of Ontario Hydro and municipal utilities, civic officials and executives of the O.M.E.A. and A.M.E.U., as well as representatives of press and radio services. Held on the main floor of the new edifice, which admirably lent itself to the role of temporary auditorium, the ceremony was highlighted by the presence of W. Ross Strike, Ontario Hydro's Vice-Chairman. Associated on the speakers' rostrum with Mr. Strike and introduced by General Manager J. E. Teckoe Jr., were: J. Clark Keith, former General Manager; E. A. Washburn, Stratford, President of the A.M.E.U.; Windsor Commissioners H. C. Paillefer, Wil-

liam Anderson and Gordon Fuller; S. Howard Gillette, Secretary-Treasurer; D. J. Cameron, Architect; Rev. S. R. Henderson, Windsor, who offered dedicatory prayers and Rt. Rev. W. J. Langlois, Dean of Essex, who pronounced the Benediction.

#### Guest Speaker

As the chief speaker, Mr. Strike, introduced by Commissioner Gordon H. Fuller, President of the O.M.E.A., said the building represented a "monument to those who have passed on, because it did not grow overnight, and a tribute to those who are still serving the Windsor Commission."

Especially significant, Mr. Strike declared, was the fact that all associated with the new building had not worried about who would get credit for this achievement, but had worked unceasingly to ensure that it would be adequate for the future in which they displayed undiminished confidence.

Recalling the history of the new building, Mr. Strike referred feelingly to the interest in the project displayed by the late Warren P. Bolton, a former commissioner.



# A NEW ERA

"It is a matter of deep regret that he is not present this evening to witness this event and to share in the pride which you must feel in the completion of such an impressive undertaking."

## Public Service

Turning from this personal note to the wider field of public service, Mr. Strike voiced tribute to the men who are serving municipal Hydro commissions and utility bodies throughout Ontario.

This type of public service seemed to attract the best type of business executive and leader in every community, he observed.

"I think we can find the basic reason in the fact that this type of service brings its own reward, providing a distinct 'lift' from the realization that they are helping to develop their individual communities."

The new building, Mr. Strike continued, would result in greater

service to customers and increased staff efficiency.

"It is an established fact that management cannot get the most from employees until attractive surroundings and adequate facilities are provided."

This was manifested, he said, by the recent "Open House" for Windsor Utilities Commission employees, who had brought some 400 members of their families and other friends

*(Continued on page 8)*

MEMBERS of the office staff in 1920, including Miss Vera Arnett, W. E. Wallace, J. B. Harper (longest-service member of the present staff), the late O. M. Perry, first Manager, and Glen Coutts (pictured in the inset photograph), would have willingly traded this office and display room in the Windsor Commission's first headquarters for the facilities of the modern Accounting and Credit Department on the second floor of the new building (below).







EXAMINING a commemorative plaque in the new building, left to right, G. H. Fuller, Windsor Commissioner and O.M.E.A. President; W. R. Strike, Ontario Hydro Vice-Chairman; J. C. Keith, who unveiled the plaque, and Windsor Chairman M. J. Brian.



FORMER General Manager J. Clark Keith, left, chats with his successor J. E. Teckoe, Jr.



MAYOR MICHAEL PATRICK, in a brief address at the formal inauguration ceremony, paid tribute to the Windsor utility's record.



GUESTS of the Windsor Commission at a special "open house" in their honor, a group of the 400 or more employees attending the social event inspect displays in the new sales room.

to a special inspection and social evening preceding the formal opening event.

### Devote Lives To Hydro

Paying tribute to employees of Ontario public utilities, the speaker said that many "devote their entire lives to Hydro, refusing to leave in spite of the fact that they are offered more attractive positions and salaries elsewhere."

Mayor Michael Patrick, who was also seated on the main platform briefly extended congratulations to members of the commission "for this great contribution to the advancement of the community."

"This new building represents the foresight, determination and self-sacrifice on the part of all commission members."

In his introductory remarks, Chairman Brian said the operations of the Windsor Commission saved the city departments a great deal of work. Built at a cost of some \$700,000, the new building was free of debenture debt — representing a saving of some \$400,000 in interest charges to Hydro customers — and was designed to serve an ultimate population of approximately 500,000 people.

Officiating at the unveiling of a dedicatory plaque in the main corridor of the utility edifice, J. Clark Keith, former General Manager, made reference to Scripture in citing water and light as two of the possible elements sustaining life.

Recalling the fact that a century ago, Windsor had witnessed the laying of a cornerstone for a new village hall, Mr. Keith said that the foundations for this latest civic building were laid many years ago, but the actual date was uncertain.

"It may have been in 1914 when Hydro, in this city, became a publicly-owned utility, or when electricity first came to Windsor in 1886."

In the unveiling of this plaque, he said, the building became an institution dedicated to public service.

"It was not planned for today alone; it was made to meet the needs of this community in the days that lie ahead. Facing the east we might hope that it will witness not only the rising of countless suns, but the dawn of a new era of peace in this rather troubled world."

—by Boyd L. Graham.



# Back to School

ONTARIO HYDRO CO-OPERATES IN TRAVELLING

## SCHOOL FOR FIRE PREVENTION OFFICERS

ONTARIO's fire prevention officers have been going back to school in recent weeks.

This travelling school, which has visited or will, in the near future, visit several provincial cities, is being held to acquaint these fire guardians with some of the intricacies of detecting deficient wiring or other electrical faults.

Under a recent amendment to the Ontario Fire Marshal's Act municipal fire authorities are authorized to carry out inspections of electrical installations and wiring in buildings and other structures. Where they deem them to be inadequate or in need of repair from the standpoint of fire safety they may order a re-inspection by Ontario Hydro electrical inspectors.

The Fire Marshals Amendment Act, 1956, provides that "If, upon such inspection, it is found that a building or other structure is by reason of the inadequacy or want of repair of the electrical installations and wiring therein especially liable to fire, the officer making the inspection may order a re-inspection by The Hydro-Electric Power Commission of Ontario of such electrical installations and wiring and that the cost of such re-inspection be paid

by the owner or occupant of the building or other structure."

### Order Re-Inspection

In practice, the fire prevention officer who may discover electrical fire hazards during the course of his inspections, will fill out an order for re-inspection, which the recipient must forward to the local Hydro area office within a specified time limit. Stiff penalties are provided, both for failure to forward this order within the time limit,

and for failure to carry out Hydro recommendations when reinspection by a Hydro electrical inspector has been completed.

There is a total of 525 individual full-time and volunteer fire departments in Ontario. While some of these have never designated any person to act as fire prevention officer, it is expected that the additional authority granted under the act may prompt many of them to make such

*(continued on page 23)*



△ CO-OPERATING with the Ontario Fire Marshal's Department in the classes, Hydro's Assistant Chief Electrical Inspector, Keith Belamy, explains how Commission regulations apply to residential electrical installations with this large demonstration panel.



△ DURING the recent classes held in Toronto, J. H. Stevens, Ontario Fire Marshal's Department representative, discusses a problem with a fire prevention inspector attending the course.



△

WATCHING an Iroquois home being placed on the huge house-moving machine, Canada's Governor-General gets a "briefing" from Hydro's Rehabilitation Engineer, J. H. Jackson (left).

# *VICE REGAL VISITOR*

WARM approbation of the "skill, perseverance and imagination of Canadian engineers" was expressed by His Excellency, the Rt. Hon. Vincent Massey, Governor-General of Canada, at the conclusion of a recent comprehensive tour of the St. Lawrence Seaway and Power Projects.

In a demanding program, which began in Montreal at 8 a.m., His Excellency inspected the progress of seaway work in the Montreal-Cornwall area in company with Hon. Lionel Chevrier, President, St. Lawrence Seaway authority and other officials.

On arrival at Cornwall the Vice-



regal party was greeted by Hon. W. K. Warrender and W. Ross Strike, Ontario Hydro Vice-Chairmen and Dr. Otto Holden, Chief Engineer.

### Sees House Moved

Following a Seaway authority luncheon at Cornwall, the Governor-General and his party moved on to Iroquois where arrangements for relocating the village were explained by Hydro's Rehabilitation Engineer J. H. Jackson. The Governor-General talked with Mr. and Mrs. Andy Major as their five-room, frame house was being loaded on to the giant house-mover for transportation to a new lot. Mr. Major mentioned that he, his wife and three children had been temporarily housed in a fully-equipped house, provided by Hydro, while the house in which they had lived for five years was being moved.

His Excellency, Mr. Chevrier, Mr. Warrender and others in the party also toured through the home of Mr. and Mrs. C. V. Ellis, which had been relocated the previous day.

The Iroquois lock site, looking across the river to Rockway Point where the control dam is being built, was viewed from the lookout tower, where Seaway Authority Chief Engineer Gordon Murphy gave a report on progress at that point.

Returning to Cornwall, Mr. Massey was briefed on the excavation work and construction of concrete sections of the powerhouse by Hydro's Project Manager Gordon Mitchell.

### Visits U.S. Sites

Midway across the world's largest cofferdam, the Governor-General was greeted by Col. W. S. Chapin, General Manager of the Power Authority of the State of New York, and then escorted on a rapid tour of the construction operations on the U.S. side of the river.

Guest of Ontario Hydro at dinner in the Cornwallis Hotel at Cornwall, Mr. Massey said he had enjoyed a fascinating day.

Terming the St. Lawrence Seaway

and Power Projects "magnificent achievements," His Excellency expressed the view that all too little was known about these developments. When they were first launched, everybody read about them, but even great projects are in competition with other things that vie for public attention.

"I know as a layman, and very much of a layman, that a great deal of ingenuity is represented in the work going on here. . . . and I was very glad that my visit coincided with Ontario Hydro's Golden Jubilee.

"I have had the very great plea-

sure of seeing one or two great engineering projects for which 'Hydro,' as we affectionately call it, has been responsible. About two years ago I spent the better part of a day viewing the installations at Niagara Falls. I cannot help but think today of what that man of vision and determination, Sir Adam Beck, would say if he could see what his Commission has accomplished.

"The achievement of houses being moved by that indefinable engine of gentleness and force at Iroquois surely marks Hydro as an example of the astounding results of one man's vision." ■

HYDRO'S St. Lawrence powerhouse and the concrete-mixing plant formed an impressive background for this photograph of, left to right, Dr. Otto Holden, Chief Engineer; the Governor-General, and Hon. Lionel Chevrier, President, St. Lawrence Seaway Authority, during the tour.



CROSSING to the United States side of the St. Lawrence River for a brief visit, His Excellency pauses to discuss progress in this area with Col. W. S. Chapin, General Manager, Power Authority of the State of New York (left), and Hydro's Vice-Chairman, Hon. W. K. Warrender.





DANIEL B. DETWEILER  
1860-1919

"Where there is no vision  
the people perish"

# THE COMMITTEE OF ONE

ONE OF ONTARIO'S FIRST ADVOCATES OF PUBLIC OWNERSHIP OF POWER RESOURCES, DANIEL  
B. DETWEILER CARRIED HIS 1886 DREAM TO REALITY BY PERSISTENCE AND PERSUASION

By Horace Brown

"**W**HERE there is no vision, the people perish."

Those words kept ringing in his ears, running counter to the subdued noise of the rapidly - filling auditorium. He had used them often, and to good effect, in the past two decades.

Turning his head slowly about,

he savored the scene with the quiet satisfaction of a man who feels his work well-done. If there was a slight hurt in his heart that arrangements had unaccountably slipped and he was not an invited guest of honor, the feeling was outweighed by a sense of accomplishment. He had not been a man to seek glory,

and he did not propose to start now.

It was a good day, he thought, this day of October 11, 1910, in Berlin, Ontario. As the birthplace of Hydro, it had been given the honor of being the first community to formally receive power from Ontario Hydro — power from far-off Niagara.



The broad-shouldered man's reverie was broken by a familiar sound. For a puzzled moment, he could not identify the cry. Then his head came back involuntarily. They were calling his name from the platform, and the arena, with its colorful array of banners, was beginning to ring as the audience took up the cry:

**"Detweiler! Detweiler!"**

For a moment he could not credit what had happened. Slipping quietly into the arena, with his friend, Jacob Klotz, he had considered himself merely a spectator. It was hard to adjust to the reality, yet there was the Prime Minister of Ontario, Sir James Pliny Whitney, advancing to the apron of the platform, and calling his name with more vigor than anyone else.

Slowly, almost reluctantly, the man rose from the obscurity of his seat. Hundreds of eyes were turned towards him. Spectators were rising everywhere, applauding, the applause turning to cheers. Premier Whitney was halfway down the platform steps, his hand extended in welcome. Detweiler marched forward modestly to grip the outstretched hand of the Premier and be led to a place of honor on the platform among those who had made this event possible.

The father of Hydro, the famous "Committee of One," Daniel B. Detweiler, of Roseville, had come home.

It is said that some men are born great, and others have greatness thrust upon them. There is still another group: those whose greatness is only realized gradually, and, perhaps, long after they have passed away.

### Permanent Niche

Such a man was Dan Detweiler. Over the years, since his untimely death at the age of 59 on April 18, 1919, a picture of the man has been slowly emerging that has earned him a permanent niche in the annals of Ontario Hydro.

His comparative obscurity was due, in a large measure, to Mr. Detweiler's character. He was, it is apparent, a most modest and unassuming person where his own welfare was concerned. Where the public weal was ever in question, he was a lion in its guard, a forthright and indefatigable champion of the rights of both the individual and the mass. His remarkable energies were almost completely devoted to promoting public movements. This led to a spectacular array of public achievements for which he was content to have others assume the credit. All Dan Detweiler ever wanted was to see the job done; he did not care who did it.

A voluminous letter-writer on every conceivable public subject, he also kept meticulous diaries, written in note form, that, at long last are providing the clues to the vital role he played in Ontario's public power enterprise. Ideas seemed to spill from his brain through his pen to paper, ideas that today are accepted facts.

In common with those other Hydro pioneers, E. W. B. Snider and Adam Beck, he had little formal education. Like them, he did not finish public school. But all three, it is apparent, never stop-

ped learning throughout their lives. For his part, Detweiler was particularly fortunate in the young lady he married, the former Adelaide Moyer, who now 87, still lives in Kitchener. Mrs. Detweiler had been a school teacher before her marriage, and aided and abetted her husband in his numerous campaigns, often correcting his many speeches and letters. All three men, indeed, owed much to their wives — Adelaide Moyer Detweiler, Nancy Weber Snider and Lillian Ottaway Beck.

The record of Dan Detweiler's civic, provincial, and national accomplishments would require many pages. He was a dreamer, who saw large visions and had the capacity to communicate his enthusiasm for these projects to other men of influence and public spirit. Not only was he one of the first proponents of public ownership of Ontario's power resources, he also was responsible for the formation of the Deep Waterways Association, that led directly to the building of the Welland Ship Canal, the jugular vein of the Great Lakes-St. Lawrence River system. In June, 1910, he suggested to Hon. William Lyon Mackenzie King that Canada and the United States should jointly

*(continued on page 14)*

J. R. DETWILER (who omits the "e" in the family name), a son of Daniel Detweiler and a member of the Ontario Hydro staff in Toronto, left, with his mother and brother, Milton, both of Kitchener, examine an album of carbon copies of the Hydro pioneer's handwritten letters, which dealt with a variety of topics.



construct the St. Lawrence Seaway, as a memorial to the 100 years of peace between the two countries, perhaps the first public mention of the Seaway, which is, at last, being built. Studying the Employers' Liability Bill that had been introduced in the State of Washington, he sent a copy to W. K. McNaught, a Toronto member of the Ontario Legislature on February 11, 1911; this action was the forerunner of the Ontario Workmen's Compensation Act, considered to be one of the finest pieces of legislation of its type on the continent.

His largeness of mind is shown by his action on June 3, 1912, when he proposed to Hervey M. Bowman the idea that Adam Beck should be knighted for his services to Ontario Hydro. Finding the idea most acceptable, he immediately wrote to Canada's Prime Minister, Sir Robert L. Borden, urging that Adam Beck be so honored.

He vigorously proposed town planning for Berlin (now Kitchener), secured Cressman's Bush as a park (renamed Attiwandron Park), advocated (September 18, 1913) in a letter to Roblin Doyle, Niagara Falls, that an international bridge be erected at the Falls as a peace memorial. The range of his activi-

ties was so great that this record can only contain a few highlights.

Yet, throughout his life of unselfish service to mankind, he held paramount the role he had played as one of the fathers of Hydro.

As early as 1886 in Roseville, D. B. Detweiler had spoken of bringing electric power from Niagara to the community. The proposal had met only polite and noncommittal smiles, for his neighbors, although they were fond of Dan, considered his schemes "hare-brained."

Born at Roseville on April 10, 1860, he was one of a family of nine children. His father was Rev. Enoch Detweiler and his mother, Abigail Bechtel. Both of his parents came from Pennsylvania at an early age.

#### Worked At St. Jacobs

When he left public school, Dan Detweiler worked at a cheese factory in St. Jacobs, the home of E. W. B. Snider, until he was 19. Both men were friends for years before they embarked together upon the project of public ownership of power, the family homes being situated only a short distance apart.

For 13 years (1890 to 1903) Detweiler travelled for the Jacob Y.

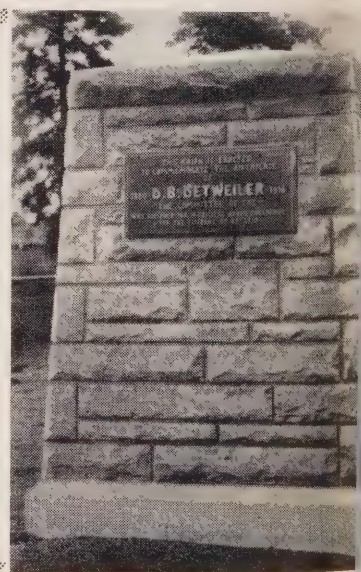
Shantz Button Company. His diaries show that his trips took him as far east as the Maritimes, and the names of Montreal, Quebec, and Halifax are frequent entries in the pages. He also made many trips to the northern United States, particularly Buffalo. This meant that he was constantly broadening the horizons of his many quests. In 1903, he worked for a short time as a traveller for the Berlin Button Company, owned by George Schlee. After that, it appears, he devoted all his waking hours to Hydro and his other schemes for the public good.

Although not a man of means, D. B. Detweiler owned securities in the Volcanic Oil and Gas Company (now known as the Union Gas Company). After several attempts to dispose of this stock, in order to have money for himself and his family while he devoted his energies at his own expense to propagating the idea of Hydro, he sold them for \$4,000 to William Braniff, although they are now worth, of course, considerably more. He had other securities, which he, likewise, disposed of for the same reason. His brother, Noah B., was President of the G. V. Oberholtzer Shoe Company, and Dan was made a vice-president of this firm because of



◁ RECORDS indicate that it was D. B. Detweiler who was responsible for renaming this Kitchener plant the "Hydro City Shoe Manufacturers Limited" in 1916 after the city's name was changed from Berlin to Kitchener.

THIS cairn at Roseville, Ont., birthplace of Daniel Detweiler, honoring the memory of the "Committee of One" was dedicated on October 24, 1955. Ontario Hydro also commemorated his achievements by officially renaming a new transformer station at Petersburg the "Detweiler Transformer Station" on February 17, 1953. ▷





the stock he held in the company. Apparently the position was quite honorary, although he eventually received an honorarium of \$100 a year for the post, plus small dividends. In 1916, the name of this concern was changed to the Hydro City Shoe Manufacturers Limited, and the change seems to have been made at the suggestion of the vice-president. Dan Detweiler had campaigned to have the name of Berlin changed to "Hydro City," when it was decided to rename the city during the First World War, but lost out. He then suggested to his brother that, at least, the name of "Hydro City" could be perpetuated in the company . . . and so it is to this day.

By delving diligently into the Detweiler documents, it is reasonable to assume that their author had a vision of the future of Ontario and of Canada held by few men of his time.

### Seized Opportunity

The path he took to public ownership of power in Ontario was a long and hard one, bestrewn with the rocks of indifference and the thorns of ridicule. A former President of the Berlin Board of Trade, he talked so much about the need for public power that his fellow-members, as a sort of exasperated jest, appointed him a "Committee of One" to look into the matter. Dan Detweiler seized upon the opportunity thus presented him, where a lesser man would have been discouraged by the seemingly empty gesture.

As the now-famous "Committee of One," he travelled from Berlin to Galt and many surrounding communities, on his equally-famous bicycle that is now a prized possession of the Waterloo Historical Society museum in the Kitchener Public Library. Everywhere he went, he buttonholed anyone who would listen to him. At first, there was resistance and sometimes a certain hostility, but Dan Detweiler

persisted. His fervor and sincerity were contagious; the ranks of the converts to the ideal of a publicly-owned power enterprise grew gradually, and men of influence finally came to his aid.

The story of his historic association with that other great pioneer, E. W. B. Snider, was told in the May issue of *Ontario Hydro News*. The meetings these men called in Berlin, with Snider in the chair, and Detweiler as secretary, were the cornerstones upon which the great edifices of Hydro in Ontario were erected. It was Dan Detweiler



who first secured the interest of Adam Beck. Beck took the scheme, of which Detweiler and Snider were the architects, and became the untiring builder of what is today, only 50 years later, one of the greatest public electrical utilities in the world, with assets of almost two billion dollars and more than direct 17,000 employees . . . The Hydro-Electric Power Commission of Ontario, owned by and operated for the citizens of this province.

But, to one who makes an intensive study of this period of history that began in 1886 with a man in Roseville having visions of power one day coming from Niagara to his community, the thought persists that if it had not been for a lone

man on a bicycle — the "Committee of One" — Hydro, as we know it today, might not have come into existence.

Dan Detweiler accomplished many things in his lifetime. None was greater nor had more profound effect than the work he promoted so unselfishly in the name of public power.

Perhaps this is best summed up in the resolution passed at the meeting of the Kitchener Light Commission on April 24, 1919, a week after Mr. Detweiler's death:

"Whereas the services of Mr. D. B. Detweiler, a respected and valued member of this Commission have been terminated by his Creator.

"Be it, therefore, resolved that we, his colleagues on this Board of the Kitchener Light Commission, wish to express our deep appreciation of the valuable services he has rendered to this city during the five years he has shared in the deliberations and work entailed by the operation of this important department of the city's utility.

"We also express our profound sense of appreciation of his breadth of vision, his accumulation of valuable data, and his persistence in enlisting the co-operation of others in crystallizing his visions into practical achievements for the betterment of his fellowmen.

"It has been a pleasure to have been associated with him, not only because of what he has done, but because of what he was — a modest, unassuming, yet capable man."

That was Daniel B. Detweiler, the Committee of One, in essence.

The watchword, whose practice has earned him a place in history, still challenges those who follow.

"Where there is no vision, the people perish."

Sailor: "Your Dad's mad because we used his car last night? How did he learn that?"  
Girl: "We hit him."



# KINCARDINE'S BIG BOUNCE

**K**INCARDINE, on the shore of Lake Huron, needed industry. Furniture factories supplied about the only industrial employment for the community.

Early last year several United States visitors inspected an abandoned planing mill on the town's outskirts, which, at one time, had furnished employment for some seven men.

Naturally enough the community "buzzed" with rumors — rumors, which eventually became facts. The Yale Rubber Company of Sandusky, Michigan, was looking for a place to locate a Canadian factory. Started at Yale, Michigan, in 1945, it had grown rapidly from its initial production of only one rubber product, to the manufacture of some 3,000 custom-tailored rubber products and a payroll of 460 people. The employees were so imbued with the "family spirit" of the firm that they rebuilt a one-storey concrete, brick and steel structure, with 85,000 square feet of floor space, almost entirely by their own labor, when the original plant was destroyed by fire in 1952.

This U.S. firm had looked at the Canadian market and found it good. In 1953 it began selling here and by the next year its orders had grown sufficiently to establish a



WORKING in overalls, Ray Brooks, Vice-President — Production, feeds a large block of raw rubber from southeastern Asia into the plant's giant intermix machine, which is, operated by a 300-horsepower electric motor.



**Yale Rubber Company, with a variety of electrically-operated equipment, establishes Canadian plant in Lake Huron town**

**By Horace Brown**

HELEN BEIRNES is shown at an electrically-operated burring machine as she fits a hinge on a rubber accelerator pedal, one of the plant's chief products.



Canadian sales headquarters. But there was one flaw: the company found it could barely compete with Canadian firms by the time it had paid duties on its products. This sparked a quiet search for an enterprising Ontario town where a Canadian plant could be located. Kincardine was finally selected as the site owing to its proximity to water, an important commodity in the manufacture of rubber products.

In common with many other industries, this firm requires a substantial and dependable supply of electricity. Ontario Hydro's Georgian Bay Regional representatives and the Kincardine Public Utilities Commission were consulted and gave their active support. Ontario Hydro built 2.5 miles of 44 kv. line to the abandoned planing mill, which was to form the initial base of operations for the company, while the local utility constructed a 750-kva. substation for the new firm. An addition was built to the planing mill before actual processing started.

In October of last year, the planing mill building was humming again, forming an essential core of the new Canadian company's activities. By the end of 1956, the number of employees is expected to reach 75 and the plant will, it is anticipated, be operating with three, eight-hour daily shifts.

"We should double our present 15,000 square feet of floor space in five years," predicts the genial President and General Manager of the concern, Lyall Runciman.

Mr. Runciman is also a vice-president of the U.S. counterpart, but he stresses that the two operations are entirely independent of one another and that the Canadian firm stands entirely on its own merits.

Rubber is not *all* rubber, it was learned, when *Ontario Hydro News* visited this interesting plant recently. The crude rubber used in the various processes comes mainly from southeast Asia and Malaya, while synthetic rubber produced at the Polymer Corporation plant in Sarnia is also used. The crude rubber, known as "latex" is either a "pale crepe" or a "smoke sheet." The latter is smoked over fires by the natives and gives off a "smoky" odor at various stages of the manufacturing process.

Numerous ingredients, such as carbon black, which resembles soot; special clays from South Carolina for fill, as well as various colors, depending upon the color required for the finished product, are mixed into the crude rubber. These raw materials are thoroughly weighed and mixed like a druggist's prescription according to formulae, which

are closely-guarded trade secrets.

The ingredients are put into the huge, intermix machine, which is operated by a 300-horsepower electric motor. After being mixed at a special temperature and for the required period of time they are placed on an electrically-operated conveyor belt, which takes them into what is known as the "mill," where they are rotated between two huge steel rollers, which fashion them into recognizable sheets of rubber.

In the next phase of production, the rubber is put through extruders. These machines, operated by 35-horsepower motors, work on the same principle as a domestic meat-grinder, except that the worm gears are much larger.

A die in the shape of the product being manufactured is placed in each of the extruders. Dies are smaller than the actual shape of the product to allow for the swelling of the rubber. The design and manufacture of these dies is both important and intricate, Yale dies being prepared at Kincardine by the firm's die-maker.

#### **Cured In Autoclave**

The rubber, upon leaving the extruders, is placed on long trays or coiled in a round pan for the curing operation in a huge autoclave under

*(Continued on page 18)*





△ FED into the extruder machine by H. Smith, background, the rubber emerges in ribbon form, passes through a "bath and powdering" process and thence along the conveyor belt where its diameter is measured with a caliper wielded by Orin Richber, foreground.

15 to 50 pounds of steam pressure. The length of time required for this operation depends upon the amount of steam pressure and the item being produced.

Creating extra din in a naturally far-from-quiet plant are the 250-ton steam presses, which mould the rubber into the products desired. These huge presses, two of which can be handled by one operator, are heated by an automatic, oil-fired steam boiler. The extruded rubber is cut to a specific size and placed in large

moulds, machined to the shape of the product required. The moulds are then placed on platens through openings in the large presses. The number of platens used depends on the size of the moulded part being produced.

After moulding, the product must be finished or given its final touches. This is accomplished in various ways, such as "tumbling" with a machine resembling an old-fashioned washing machine or on electrically-powered machine trimmers and

punch presses. After inspection on conveyor belts, the product is ready for packing and shipping.

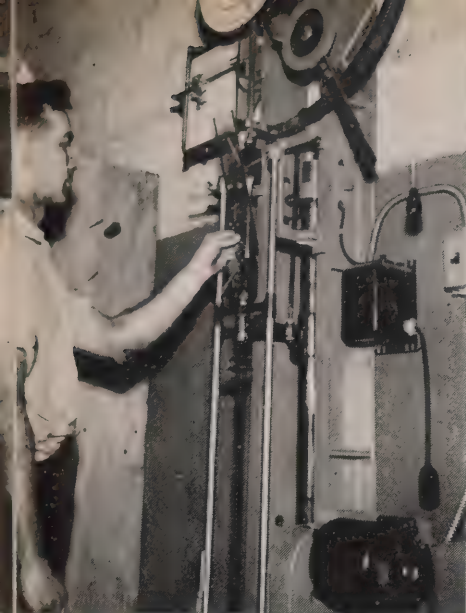
An important man at the Kincardine plant is the chemist. Upon the shoulders of youthful Dennis Sleet, a science graduate of the University of Toronto, rests the responsibility of the success or failure of the complicated formulae used in the manufacture of Yale products. What he *does* depend upon in his compact and efficient laboratory is the electricity which operates the various testing machines.

More than 50 ingredients are used by this chemist in devising new formulae and revising the old ones. One of these ingredients has been used for years in rubber-making, as an accelerator to the curing process. Recently, this same ingredient, antabuse, came prominently into the news as a potent but apparently successful cure for alcoholism. As many as 14 ingredients are used, for instance, in the making of one type of rubber hose.

With color in greater demand than ever before, Mr. Sleet has been giving considerable attention to the problem of developing stable colors. In many instances, several experiments are necessary to produce a rubber product in a color required to match colored refrigerators, washing machines and other types of equipment.

An electrically - operated Scott tester helps him in his tests for elongation of rubber. Run by a quarter-horsepower motor, the tester indicates the strength of the rubber. Similarly, he has a Dillon tester, to determine the adherent properties of rubber on certain types of metal,





YALE PRESIDENT Lyall Runciman stands before a display board, which indicates the variety of rubber products manufactured at the Kincardine plant.



DENNIS SLEET, plant chemist, finds electricity particularly useful when he is using such devices as this Scott tester to determine the strength of rubber.

a matter of importance in present-day processing of this material.

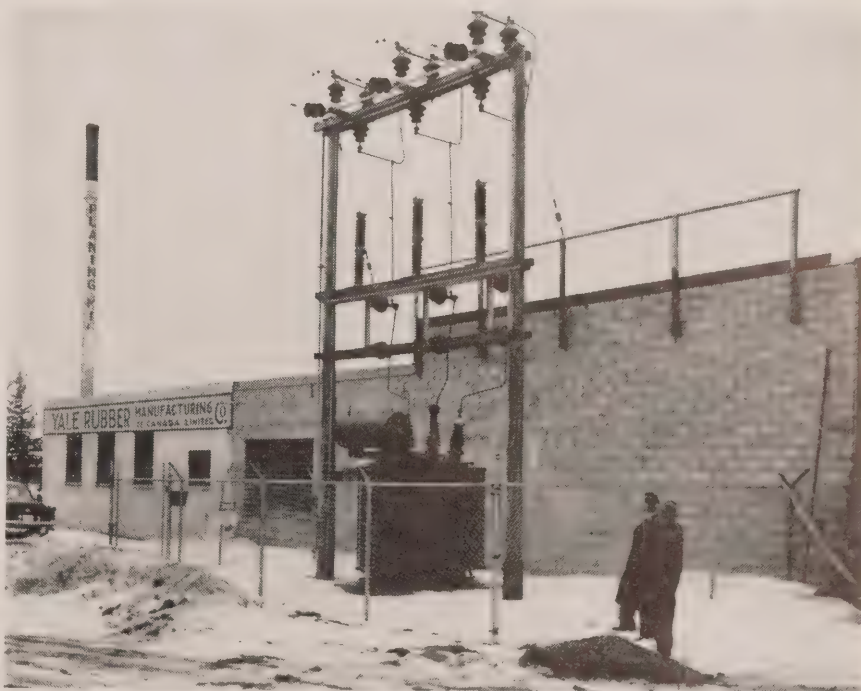
### Largest Item

Hose for washing machines is presently the largest item turned out by the Kincardine plant, but there are many other products, ranging from the large rubber insert of a shock absorber used on a large automobile to such small things as cane ferrules and tiny rubber washers. In its first year of operation, the factory will have turned out literally millions of these items. Some are so small that the only profitable way to handle them is by "weigh-counting," i.e., so many items to the pound. Latterly, on an electrically-operated burring machine, the plant has been producing the familiar automobile accelerator pads at the rate of 1,500 daily.

Executive officers of the Canadian company, in addition to President Runciman are: Eldon Henderson, executive vice-president; E. Nowel Lee, vice-president-sales; Ray Brooks, vice-president-production, and Russell C. Henderson, secretary-treasurer.

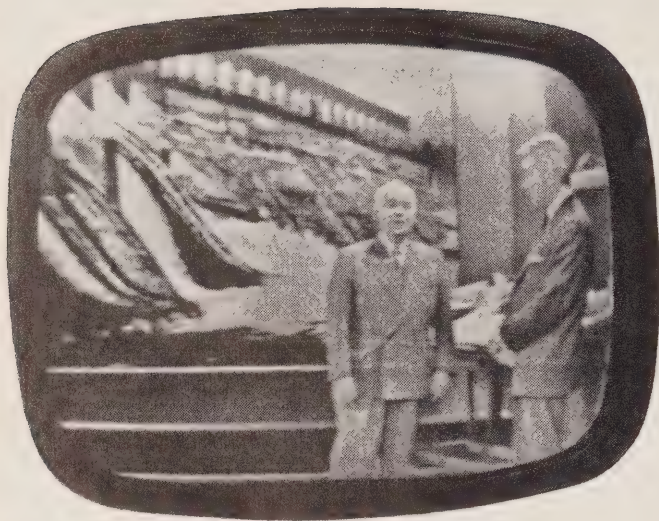
"By 1960, we should be employing

*(Continued on page 33)*



ONCE a planing mill (as indicated by the smoke stack), the now-humming rubber factory is served by this Kincardine P.U.C. substation and 2.5 miles of 44-kv. line built by Hydro.

# ARMCHAIR TOUR



**AUDIENCE OF 32 MILLION VIEWS TELEVISION**

**DRAMA OF ST. LAWRENCE DEVELOPMENT**

DR. OTTO HOLDEN, Hydro's Chief Engineer (left), was interviewed by CBC commentator, Austin Willis, during the 90-minute telecast.

ON A recent Sunday afternoon, some 32 million Canadian and United States television viewers took a fast 90-minute trip through the St. Lawrence River and Great Lakes area.

This armchair tour was a live telecast entitled "The St. Lawrence Story" presented as the last in this season's "Wide Wide World" series.

Enroute, the comfortably-ensconced tourists paid a short visit to the Cornwall, Ontario — Massena, N.Y., areas where Ontario Hydro and the Power Authority of the State of New York are building two adjacent powerhouses as a joint effort.

Two great networks, Canada's CBC-TV and the United States' NBC, pooled their facilities to set up more than 20 live television pickups on both sides of the border at points ranging from the Atlantic coast up through the St. Lawrence

River and the Great Lakes to Duluth, Minnesota, almost 1,700 miles inland. The result was a living portrayal of the international power development in the St. Lawrence's International Rapids section, and the building of the Seaway through the entire sweep of the river and the Great Lakes.

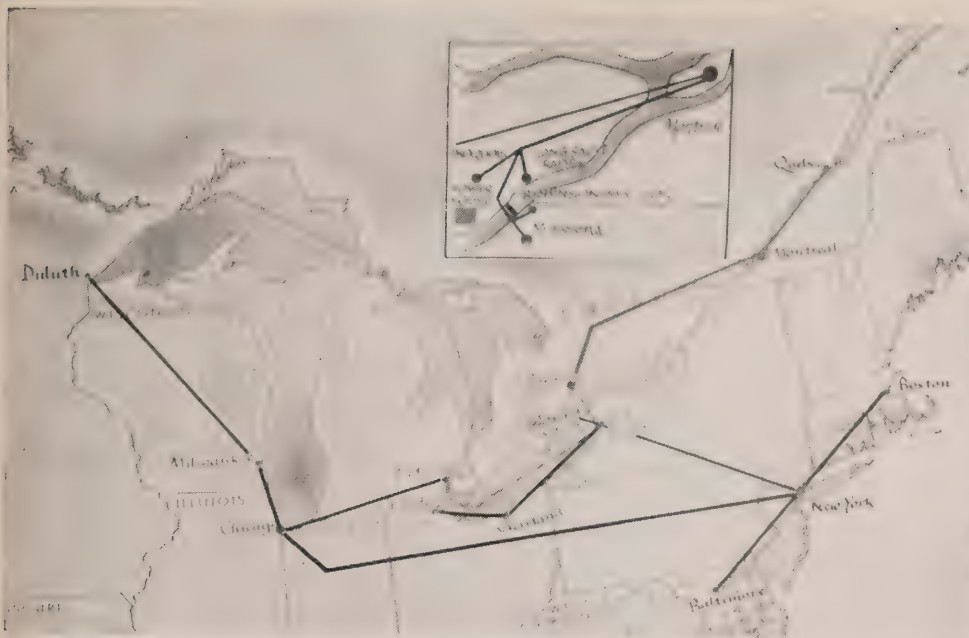
The program took the form of an imaginary voyage by ship from the Atlantic seaboard to the heart of the continent. Focussing first on the rolling surf of the rocky eastern shoreline, with the plaintive cry of gulls in the background, the live cameras moved on to Quebec to show, from a vantage point on the historic Citadel, the entrance to the seaway. Then on to Montreal for shots of the dredging and demolition work involved in creating a channel to by-pass the Lachine Rapids, a fifty-foot drop in the river level, which presents the first

big problem to seaway engineers. The turbulence of the Long Sault Rapids near Cornwall was shown by cameras mounted inches above the angry waters — violence soon to be tamed and harnessed at the adjoining powerhouses, which will span the river a few miles downstream.

## **Impact On Communities**

Other units in the "hook-up" successively visited Massena, New York, a quiet village turned overnight into a bustling boom town by the U.S. construction forces engaged in building the seaway and the New York Power Authority's share of the powerhouse. Television cameras were focussed, too, on Iroquois, an Ontario village which is abandoning its site and moving one-and-a-half miles back from the area to be flooded. Hydro work crews were shown in action here using their huge house-moving machine to





△  
HEAVY, black lines on this map link the points on both sides of the border where more than 20 television cameras and crews of the Canadian Broadcasting Corporation and the National Broadcasting Company stood by to describe successive phases of "The St. Lawrence Story."

transport a dwelling intact from the old townsite to the new.

Since the names of towns and geographic locations in the vicinity of the power project would be strange to the ears of many in the television audience, a side-visit was paid to Ontario Hydro's scale models of the St. Lawrence River at the A. W. Manby Service Centre on Toronto's western outskirts.

At this point, a television camera was trained on Dr. Otto Holden, Hydro's Chief Engineer, and an outstanding hydraulic engineer, who, during a brief interview with Austin Willis, CBC commentator, discussed interesting aspects of the St. Lawrence Power Project and the harnessing of hydro-electric power sites.

### The Project In Miniature

Derek Foulds, an Ontario Hydro hydraulic engineer, took over to show how preliminary experiments are

conducted in miniature on the model to test their feasibility and efficiency before being implemented at the actual construction site. In a two-way conversation with Dave Garroway, the full story of the model was unfolded — telling how the best locations for dam sites and channel excavation had been pinpointed through its use, with consequent savings of months of time and millions of dollars. By inserting moveable replicas of the various hydraulic structures now in the course of construction, Mr. Foulds demonstrated how Ontario Hydro and its partner in the project are turning the gradual fall of the Long Sault Rapids into a sheer drop, which can be utilized for power production. Through the backing up of the water in the International Rapids section, the Seaway authorities will be greatly aided in getting their channel through this section.



△  
MOUNTED on a gantry crane, this TV camera recorded construction progress at the site of the large international powerhouses from the top of the world's longest cofferdam.

From the model at Islington the St. Lawrence story was taken up by the electronic eye of a camera mounted on a tripod over the international boundary in the middle of the Barnhart Island cofferdam, largest of its type ever built. Interviews with officials and construc-

(Continued on page 22)

READY to record "shots" of an Iroquois home being moved to the new townsite, this CBC cameraman in the jeep, discusses final details with these Hydro representatives, standing left to right, M. E. Bradden, Rehabilitation Information Officer; Len. Bell, Resident Engineer House-moving, Michael Morgan, Assistant Rehabilitation Engineer.



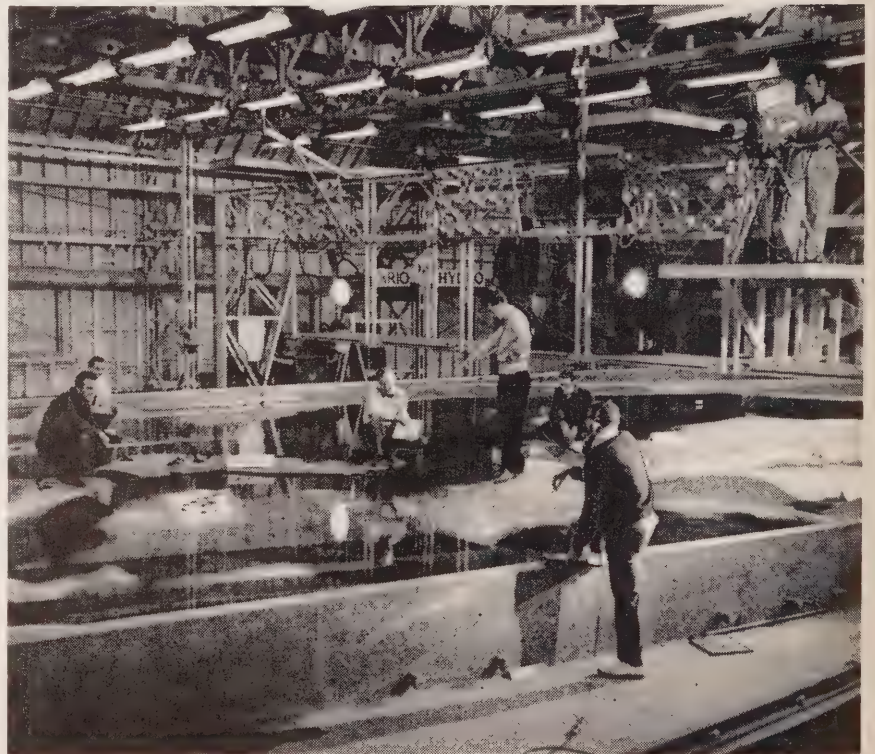
tion men engaged in powerhouse excavation and concrete placement on the dewatered river bed followed. Aerial views of the overall project area and scenes from atop a gantry crane showed how these giant weight-lifters pick up 10-ton buckets of concrete and pour them into wooden construction forms. Through a combination of skilful camera direction and script writing, a vivid picture was painted of the toil, ingenuity, money and materials which must be expended before the two nations will be able to share the output from the mammoth powerhouses along the international boundary.

### End Of The Line

Resuming the voyage along the seaway route, television cameras stopped off at main lake ports to review preparations being made on the waterfront and at industrial plants to handle the greatly increased volume of trade and marine traffic which will be an inevitable concomitant of the new, deep-water pathway to the ocean.

Some idea of the months of careful preparation, which preceded the telecast, could be gained as relays of cameras conveyed the viewer through Lake Ontario to the rapidly-growing Metropolis of Toronto, on up through the Welland Canal and its locks to Lake Erie . . . to Buffalo, world's leading flour and feed milling centre . . . to Cleveland, with its cavernous steel mills . . . to Toledo, for generations the largest coal port in the world . . . to Detroit, the auto city . . . to Chicago . . . through Lake Michigan to Milwaukee . . . from the

*(Continued on page 32)*



HYDRO personnel at the A. W. Manby Service Centre, Islington, rehearse their roles under the guidance of CBC producer Mervyn Rose. Derek Foulds, hydraulic model engineer (kneeling, centre); listens as Mr. Rose points out the salient features of the model on which the cameras will concentrate. CBC Studio Director John Spaulding is shown in the foreground.



## BACK TO SCHOOL

(Continued from page 9)

appointments. Persons so designated are legally regarded as Assistants to the Fire Marshal.

### Two-Day Lectures

In order to instruct fire prevention officers in the basic principles involved in the detection of electrical faults and deficiencies so that they may carry out their additional responsibilities under the amendment, the Ontario Fire Marshal's Department has arranged a series of two-day lectures in various centres across the province. Commencing in Ottawa, May 29 and 30, they have continued through June and July in Kingston, Toronto, Hamilton, London, Windsor, Sarnia, Kitchener, St. Catharines, Owen Sound, Port Arthur, Timmins, Sudbury and Peterborough.

Based on an average attendance of 40, which prevailed at the early classes, it is expected that from 600 to 700 persons will have benefitted from this instruction by the time the final lecture has been delivered. While the great majority of those attending are officers from the various municipal fire departments, sundry other interested organizations are being represented. In charge of the schools is D. E. Barrett, Director, Ontario Fire College, Fire Marshal's Department. Principle lecturers are D. C. McNeil, chief electrical inspector, Ryerson Institute of Technology, and J. C. Stevens, Fire Marshal's office. Personnel from Ontario Hydro, The Canadian Standards Association, the Underwriters Laboratories of Canada, the Electrical Contractors' Association of Ontario and the Canadian Electrical Manufacturers' Association are co-operating. Curriculum of the course includes instruction on such vital subjects as priority of electrical hazards; classification, types and applications of wiring; electrical hazards in dwellings, apartments, rooming houses etc., and inspection procedure and sequence from the basement to the attic. ■

## NAME CO-ORDINATOR OF SPECIFICATIONS

**A**PPPOINTMENT of M. J. McHenry, Chairman of Ontario Hydro's Standards Committee, as Co-ordinator of Specifications has been announced by G. D. Floyd, Assistant General Manager — Engineering.

This co-ordinating office has been formed to promote "the fullest use of standardization techniques and existing knowledge in the preparation and use of all Commission material, equipment and contract specifications."

In discharging his new duties, Mr. McHenry will be assisted by the Specifications Committee of the Standards organization, working closely with all divisions and departments of Ontario Hydro interested in specifications.

With full authority to develop procedures, and to further their application for maximum overall efficiency, work on three main initial objectives is already under way. The first of these is directed to the establishment of a central reference file for specification documents. This will include specifications produced within the Commission, with all pertinent data, and standards adopted by national organizations, technical societies and utilities. The second is concerned with the development and production of standard clauses, common to most equipment purchases, and for use with either standard or special-type equipment. The third objective is aimed at facilitating the interchange of data between departments and specification-writing bodies, and to assign suitable priorities in the preparation of standard specifications for material and equipment in order to accelerate production.

As Co-ordinator of Specifications, Mr. McHenry will continue to



M. J. McHENRY

report directly to the Assistant General Manager — Engineering.

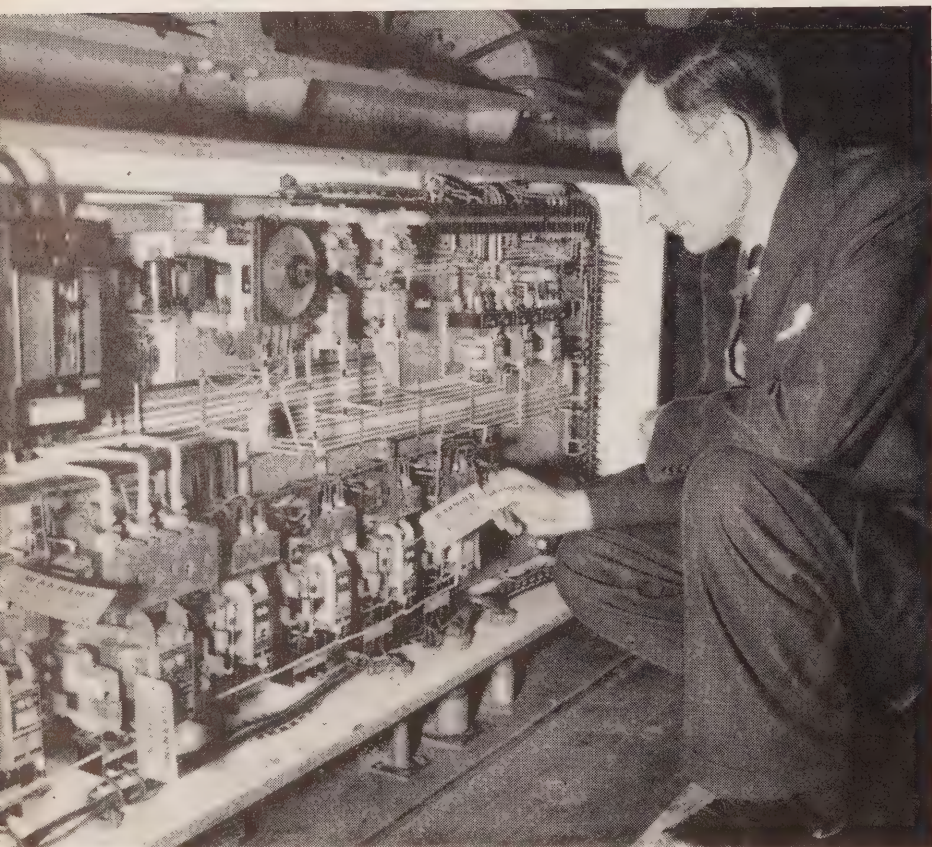
### TORONTO HYDRO DIRECTOR RETIRES

W. Frank Sutherland, P.Eng., retired recently after 41 years' service with the Toronto Hydro-Electric System. Director of Industrial Relations at the time of his retirement, Mr. Sutherland joined Toronto Hydro in 1913 as an assistant engineer and, apart from two years — 1918-1920 — when he was employed first by the MacLean-Hunter Publishing Company in an editorial capacity and then by the Deloro Smelting and Refining Company as assistant chief engineer, his service was continuous. For many years he was engaged in economic research and in 1942 was appointed Director of Industrial Relations. As a member of the Ontario Association of Professional Engineers, he has been active on committees appointed to examine salaries and remunerations.



# Changeover "Blitz"

**Two-day shutdown completes standardization of 1,500  
frequency-sensitive items at major Hamilton plant**



**F**REQUENCY standardization crews in Hamilton set a new record recently by completing a major industrial changeover in four days.

This successful "blitzkrieg" at the large plant of the American Can Company, which uses some 1,500 frequency-sensitive items, necessitated a temporary shutdown for only two working days.

The entire operation followed a meticulously-planned schedule worked out four months in advance by company and Hydro engineers.

With speed as one of its essential elements, this mammoth job was given a preliminary assist in the week immediately prior to actual changeover by placing 60-cycle motors and other replacement parts adjacent to the machines in which they were to be installed.

This saved precious time when the job got under way, as transporting heavy motors into the building and to upper floors was necessarily a slow process. The time saved by this procedure more than compensated for the temporary storage space problem created in this plant where open areas are at a premium, due to the fact that "we wrap so many millions of cans around such vast quantities of air," as one staff member observed. Some machines at this plant manufacture cans at the rate of 15,000 an hour.

When the wheels of the plant stopped turning on Thursday evening before changeover started, Hydro's advance guard marched in and got the project off to a flying start by removing 25-cycle motors, which were to be rebuilt for 60-

AMERICAN CAN COMPANY'S Chief Electrician, Jack G. Twist, examines control panel of a multi-motor body-maker and side-seaming machine. Tag warns that machine has been altered for 60-cycle operation.



cycle operation. Some of the special motors were then rushed to Hamilton electrical contractors who rebuilt them and returned them to the plant by the following Monday. The majority of the motors, new and rewound, were supplied by the Frequency Standardization Division in identified groups marked for the various floors and locations in the plant.

Normal industrial problems at the American Can Company of Canada were magnified by the size of the plant, and the special motor speeds encountered. That all these problems were successfully overcome, Hydro attributes to the co-operative planning with the company's staff including H. F. Smith, plant manager, G. Herb Pangborn, mechanical superintendent, and Jack G. Twist, chief electrician. In addition, Hydro mechanics, normally occupied on domestic and commercial change-over, were specially assigned to work with the industrial technicians in order to complete this vital operation on time.

That this rapid changeover project was carried out to the complete satisfaction of the company, is substantiated by a letter from the plant manager and co-signed by the President of the Can Workers Federal Union, T.L.C. Local 354. Addressed to H. L. Watts, F.S.D. Project Manager in Hamilton, the letter read as follows:

"We are pleased to inform you that the special arrangements for converting our plant at Emerald and Shaw Streets, wherein plans were made to complete the entire trans-

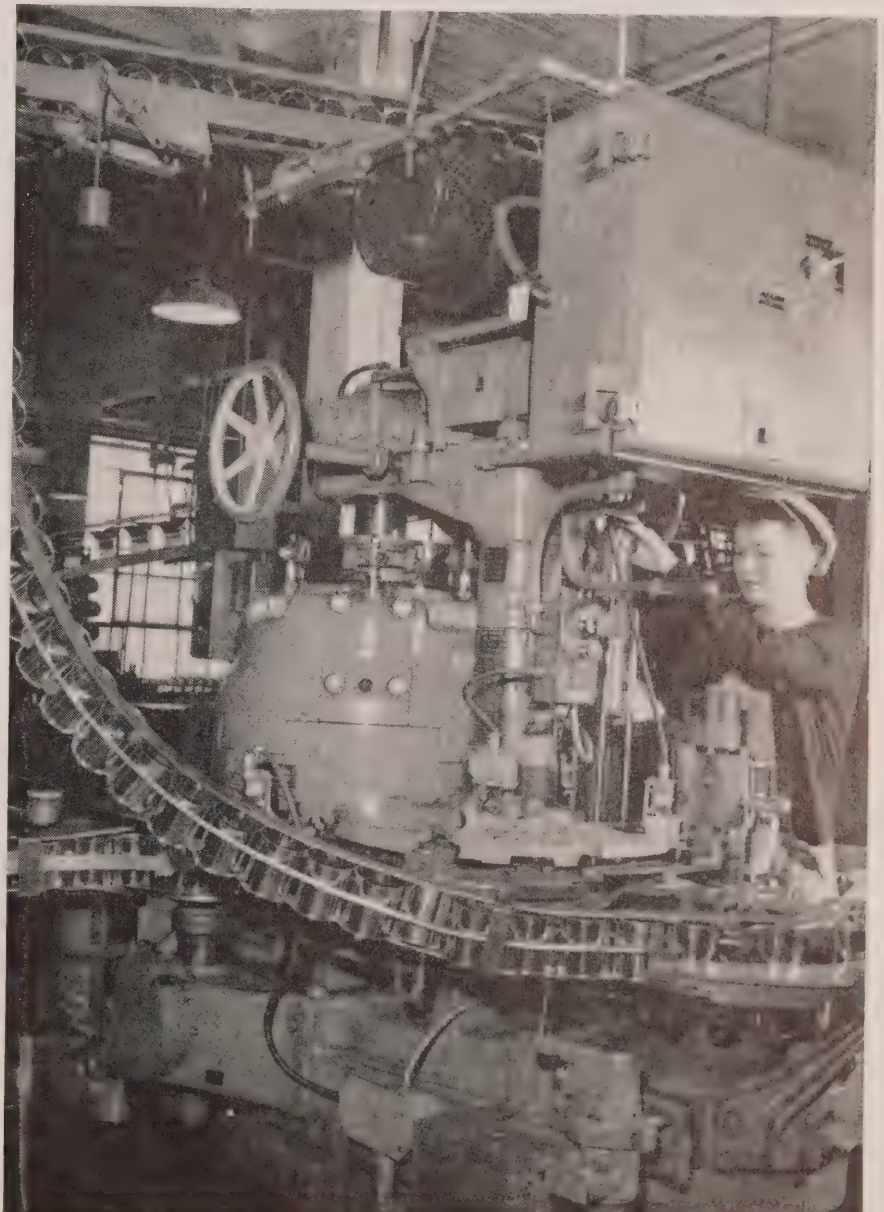
action from Friday a.m. to Monday midnight, was carried out with a minimum amount of difficulty and with a tremendous amount of efficiency on the part of the Ontario Hydro and the Canadian Comstock Company Limited representatives.

"The employees and management of this plant wish to congratulate your people on the marvellous job done in such a short time. Naturally, we did have a slight amount of inconvenience when starting up

our machinery on Tuesday but it was not serious, and 'trouble shooters' from the Comstock Company were on the job, and by the end of the week most of the small items were completed.

"The employees were so pleased with the changeover, and the fact that the work was done with losing only two work days, that our union president also wishes to express thanks for their organization."

— by Frank C. Wood.



This double-seaming machine is sealing rings on cans at the rate of 200 a minute. Powered by a three-horsepower motor, it was one of the major items changed over during the speedy operation in the large plant.





## JUBILEE DISPLAY



Woodstock Public Utilities Commission made a distinctive contribution to the Victoria Day celebrations in that city this year by entering an attractive float in a civic parade held to mark the occasion. Appropriately enough, the float, which received many favorable comments from spectators and parade officials, had, as its central theme, the Hydro Golden Jubilee. Utility officials, left to right: Glen Sanderson, Assistant Manager; Commissioner Charles Hayball; Manager C. E. Kirkby; Mayor Bernadette Smith and Vice-Chairman F. T. Julian were on hand to inspect the display before it entered the parade.

## PRESS AWARDS



An Ontario Hydro award of merit and two certificates of merit for outstanding work as correspondents on the staff of Ontario weekly newspapers were presented at the recent annual convention of the Ontario Weekly Newspapers Association at Windsor. Pictured above, left to right, are Werden Leavens, Bolton, Secretary-Manager, O.W.N.A.; Mrs. Margaret Johnston, King correspondent of the **Aurora Banner** (winner of a certificate of merit in 1955); J. A. Blay, Hydro's Director of Information, who made the presentations, and Miss Marjorie McArthur, Highgate correspondent of the Ridgetown **Dominion Press**, winner of a certificate of merit for the third year in succession. Another certificate of merit was awarded to Mrs. Percy MacMullen, **Stirling News — Argus**, who was unable to attend the convention for the formal presentation. The Hydro awards were established in 1954 as a tribute to the influential role played by the rural press in portraying the progress and achievements of Ontario's farm and hamlet population.



## STRATFORD HONORS RETIRING EMPLOYEES

John H. Wilbee and Thomas Taylor, were presented with suitcases as a token of appreciation for their lengthy service with the Stratford Public Utility Commission at the annual banquet and social sponsored by the commission recently.

Mr. Wilbee, a substation operator, who retired on pension on May 1, had been with the utility since 1929, and Mr. Taylor, a maintenance employee since 1922, retired on pension on July 1. The presentations were made by Commissioner A. E. MacIntyre.

Ian Stubbs, Consumer Service Engineer, West Central Region, Ontario Hydro, spoke briefly, while Chairman W. F. Nickel complimented the employees on their careful and efficient service. In his capacity as Mayor, Wilfred P. Gregory, Q.C., traced the development of Hydro service in Stratford over the past 45 years and complimented the commission on its excellent employee relations.



## LONG - SERVICE CERTIFICATES

V. A. McKillop, General Manager of London Public Utilities Commission, was elected President of the Canadian Section American Waterworks Association at the recent 36th annual convention in London. Mr. McKillop is shown in the photograph above standing next to former London P.U.C. General Manager, E. V. Buchanan (extreme right), who served for 37 years in that capacity and who received a certificate from the Canadian Section for 30 years' service and a life membership from the parent association. Making the presentation of the life membership was President F. C. Amsbury, Lynbrook, N.Y. (left) with R. B. Hanna, veteran Manager of Listowel P.U.C., who was honored for 25 years' service. Presented with 15-year certificates were S. R. McBrien, Superintendent, Aylmer P.U.C., and Norman E. Wilson, Amherstburg.



# NAME A.M.E.U.

## LIFE MEMBERS

ONTARIO'S Association of Municipal Electrical Utilities recently augmented its roll of life members.

Raising the total to 21, framed testimonial scrolls were presented to three Past Presidents: C. E. Brown, P. Eng., Hamilton, who was A.M.E.U. President in 1941; S. W. Canniff, P. Eng., Ottawa, 1944-1945, and R. J. Smith, Perth, 1946.

The tribute to the three veteran members of the A.M.E.U. highlighted this year's Past Presidents' dinner in Toronto, with three former Presidents, R. H. Starr, Toronto Township; Robert Butler, Owen Sound, and M. W. Rogers, Carleton Place, making the formal presentations.

Mr. Brown was born and educated at Meaford and served as Manager of Meaford P.U.C. from 1924 to 1944, at which time he resigned to establish his own consulting engineering business in Hamilton. Mr. Canniff, who retired as General Manager of Ottawa Hydro-Electric Commission in 1948, is a native of Napanee. He joined the staff of the Ottawa Commission 42 years ago as a substation testing engineer, becoming Assistant General Manager in 1930 and General Manager in 1937. R. J. Smith retired as Manager of Perth P.U.C. in 1953. He possesses a unique record of public service in Perth, having started work on the installation of waterworks in that

town in 1897. On completion of the waterworks system Mr. Smith was made Manager and continued in that position until the time of his retirement.

Also honored at the dinner for their contributions to municipal life were John E. Teckoe, who successively managed utilities commissions at Strathroy, Tillsonburg and Niagara Falls until his retirement in 1946, and John York, who retired in 1938 from the Ottawa Hydro-Electric Commission where he had been line superintendent for many years. The presentations in this instance were in the form of handsome sets of cuff links. Mr. Teckoe's son, J. E. Teckoe, Jr., is now General Manager of the Windsor Utilities Commission. Mr. York's son, F. G. York, who is now General Manager of Ottawa Hydro-Electric Commission, accepted the presentation on his father's behalf.

Guests at the dinner, which was chaired by H. Allan Howard, included W. Ross Strike, Vice-Chairman of Ontario Hydro, who extended greetings from the Commission to those attending the dinner, and Gordon Fuller, O.M.E.A. President, who performed a similar duty on behalf of the sister organization.

—By J. J. Kirkwood.



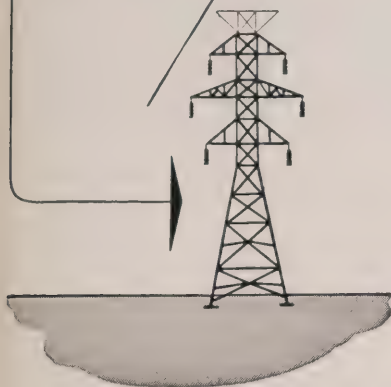
△  
THREE FORMER A.M.E.U. Presidents, left to right, C. E. Brown, Hamilton (1941); S. W. Canniff, Ottawa (1944-45), and R. J. Smith, Perth (1946), were presented with life membership scrolls.



△  
M. J. McHENRY (centre) presented cuff links to Fred York, Ottawa (left) on behalf of his father and J. E. Teckoe, Niagara Falls, for their contributions to municipal life.



# ALONG HYDRO LINES



## Stratford Seeks Property Advice

Stratford P.U.C. has engaged a London firm to make a survey of utility property and buildings. On the basis of the advice provided, the Stratford Commissioners will make a decision respecting the question of creating a new administration building on a site owned by the P.U.C.

## Burlington Cuts Hydro Rates

Local electrical customers received welcome news recently when Burlington Hydro-Electric Commission announced a general reduction in domestic, commercial and power rates. In announcing the new rate schedules, which went into effect on February 1 this year, Chairman N. R. Craig said the reductions were made possible by successful operations during 1955. Based on anticipated 1956 revenue, the new schedules will effect a decrease in earnings of approximately \$13,000 during the present year.

## St. Thomas Hydro Consumption Shows Increase Of 92 Per Cent

The annual report of General Manager J. Walton Peart to the St. Thomas Public Utilities Commission reveals an increase of 92 per cent in Hydro power consumption between 1945 and 1955. Over the same period the number of customers served has increased by 21 per cent. The report adds that the average amount of power used by each domestic customer has increased by more than 30 per cent and there are 46 per cent more electric ranges and 56 per cent more water heaters in use. These figures, states Mr. Peart, indicate that the city's present methods of handling Hydro supply and distribution, though adequate over the past 45 years, may require radical changes to cope with future load growth.

## Electric Water Heaters Popular At Burlington

Water heater revenue represents approximately 16 per cent of the Burlington Hydro-Electric Commission's total revenue, Chairman N. R. Craig announced recently. Of the 3,019 customers being served, said Mr. Craig, 1,717 are using flat rate electric water heaters. This does not take into account some large apartment buildings where one large heater is used to supply a number of customers. Heaters range in size from 400 to 3,000 watts. Most popular size of heater in use is the 750-watt type, he added.

## Lindsay Installs Radio Equipment

Lindsay Hydro-Electric Commission has completed installation of a two-way radio system for communicating with its line staff. A master station has been located in the commission's headquarters building, while line trucks have been equipped with similar transmitting and receiving equipment as a further means of streamlining system operations.

## Peterborough U.C. Reports \$223,888 Profit For 1955

Total assets of the Peterborough Utilities Commission at the end of 1955 in its electrical, water and gas departments are shown as \$8,585,678 in the annual report of General Manager W. H. Powell. Total net operating profit of \$223,888 was made up by \$188,775 from the electrical department; \$23,927 from waterworks and \$11,186 from gas.

## Kitchener Peak Load Increased

Satisfactory municipal growth is reflected in a report presented to members of the Kitchener Public Utilities Commission by S. E. Preston, General Manager, recently. Noting that the city's peak demand was approximately 16,500 kilowatts at the beginning of World War II, Mr. Preston revealed that the December, 1955, peak reached 48,539.9 kw., an increase over this 16-year period of more than 32,000 kw.

## Toronto Hydro Faces Load Growth Problem

An approximate 60 per cent increase in power consumption over the past 10 years has confronted the Toronto Hydro-Electric System with a continuing load growth problem. Presenting the system's annual report at a joint dinner meeting with the Toronto City Council, Bert Merson, Toronto Hydro Chairman, said the city's average annual consumption per customer is 5,267 kilowatthours annually, compared with the Canadian average of 3,458, and is almost double the U.S. average. In Toronto and Leaside areas there are about 150,000 television sets with a kilowatt demand equal to the peak demand of cities with about 40,000 population. Mr. Merson said the load growth will be handled by 10 terminal stations and 22 substations now built or planned — exactly twice the number existing in 1945.

## PIONEER HYDRO SUPPORTER DIES

Charles Napier Greenwood, a noted citizen of Stratford, died in his 83rd year on the eve of the celebrations on May 14 to mark the 50th anniversary of Hydro, whose ideal he had served so long and so well.

Together with W. D. Dingman, Editor of the Stratford *Herald* for many years, he became an exponent of public ownership of Hydro resources after listening to speeches by Sir Adam Beck in the early years of the century. As a result, a civic election was fought on the Hydro issue, at which Mr. Dingman was elected Mayor and Mr. Greenwood an Alderman by the largest vote ever recorded up to that time. Stratford thus became one of the

original Hydro municipalities, power being turned on in the city on Christmas Day, 1910.

Mr. Greenwood served 15 years as an alderman, one term as Mayor and for 22 years on the Stratford Public Utility Commission. Although he retired from active participation in 1949, he maintained an interest in its activities until the time of his death.

A native of Kent County near Blenheim, Mr. Greenwood moved to Stratford in 1903 where he was engaged in the undertaking business until his retirement in 1951. Active in fraternal circles, he was the leader of several movements for civic betterment. He is survived by his wife.

### Woodstock Utilities Commissioner Dies

Chairman of the Woodstock P.U.C. in 1951 and 1955 and a member of the local commission for eight years, William Francis (Frank) Craig, died in Woodstock General Hospital in his 69th year. He had been in ill health for several years, and seriously ill for three weeks.

A native of Detroit, Mr. Craig settled in Woodstock in 1912, founding his own electrical and plumbing business in the city 12 years later. This was subsequently expanded to include a machine shop, which developed into a large business, handling contracts for automobile and other firms. Mr. Craig's chief interest, outside his business, was the utilities commission, his experience in practical engineering proving of great benefit to the operation of the local system. A daughter, Mrs. George Peter, Stratford, and a brother, Herbert C. Craig, Detroit, survive.

James Carnwath, a former member of the commission, has been appointed by Woodstock City Council to replace Mr. Craig.

### Long-Service London P.U.C. Employee Dies

Henry Scott, a member of the London Public Utilities Commission staff for 39 years, died recently at the Victoria Hospital in his 63rd year. A native of England, Mr. Scott settled in London in 1911. He is survived by a son, Ronald Ian Scott.

### D. P. Herring Named City Manager

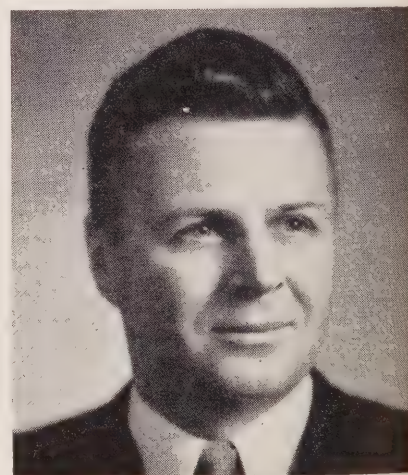
Dennis P. Herring, 41, a Sarnia consulting engineer, has been appointed city manager at Belleville commencing June 1, 1956. A graduate of the University of Saskatchewan, Mr. Herring was a member of Sarnia Hydro-Electric Commission for four years. He served as Chairman of the commission in 1952. In District No. 8 O.M.E.A., Mr. Herring held the office of Director and during the year 1953-54 was President of the district association. He also served as Director and Vice-President of the parent O.M.E.A. organization.

### Lindsay Checks Domestic Fuses

A strong campaign to warn electrical customers of the dangers inherent in over-fusing has been recommended by Manager J. A. Lightbody, Lindsay Hydro-Electric Commission.

Reporting to the commission that a recent survey of 81 Lindsay homes in different sections of the town disclosed that 70 of these homes were over-fused, Mr. Lightbody stressed that the situation was serious. He pointed out that an earlier survey showed 40 per cent of homes checked were over-fused. With the latest survey indicating that 80 per cent were using heavy fuses, Mr. Lightbody said that an endeavor to correct the situation is to be made by enclosing wiring circulars with future electric bills.

Commenting on the common complaint that 15-amp fuses frequently blow out, the utility manager emphasized that this is a reliable indication of overloaded circuits and possibly of inadequate wiring. He offered the services of the commission staff to domestic customers seeking advice on fusing problems.



**E. H. BANKS**

Hydro's Assistant General Manager and Comptroller who was recently elected a Fellow of the Institute of Chartered Accountants of Ontario. Mr. Banks was one of 46 members honored by the Institute's council in recognition of distinguished service to the profession.





## HONOR SCARBOROUGH VETERANS

**T**WO NEW members were added to the roster of the Quarter Century Club of Scarborough P.U.C. at the second annual dinner. Scarborough Reeve Gus. Harris is shown in the photograph, above left, presenting a cheque and 25-year pin to E. C. Shaddock (left), while

Commissioner A. O. Leslie (left) congratulates E. E. Butcher in the photograph on the right after making a similar presentation. The 11 living members of the club, all of whom attended the dinner, have a combined service record of 336 years.

### Retires With 45-Year Service Record

Elmer Sherman, Superintendent of Kingsville Public Utilities Commission for over 32 years, retired from active service on June 1 this year. Mr. Sherman started his electrical career in 1911 when Kingsville and district was served by the Essex County Light and Power Company. He was employed as the company's Regional Superintendent until 1918 when Ontario Hydro acquired the assets of the company. Mr. Sherman continued as Superintendent until 1924 at which time the Town of Kingsville entered into an agreement with and began to purchase power from the Commission. In March that year the Kingsville Public Utilities Commission was formed and Mr. Sherman was appointed as Superintendent. He has served faithfully and efficiently ever since. Mack Wigle, who has been with the local utility for 11 years, has been appointed to succeed Mr. Sherman.

### Honor Lindsay Commissioner

Marking almost two decades of service with the Lindsay Hydro-Electric Commission, a portrait of Commissioner J. G. Baldwin has been placed in the main office of the local commission. During a brief ceremony preceding the hanging of the portrait, congratulations were extended to Mr. Baldwin by Chairman Reginald A. Cozens and Mayor A. E. Hick.

### Returns To Consumer Service Division

Increasing volume of work in Ontario Hydro's Consumer Service Division has led to the transfer of W. R. Harmer from the Frequency Standardization Division to resume his duties as Assistant Director of Consumer Service. I. C. Ingimundson has been appointed Administration and Consumer Service Engineer in the Frequency Standardization Division, succeeding Mr. Harmer.

### Appoint Former Mayor To Exeter Commission

W. G. Cochrane, a former Mayor of Exeter, has been appointed to the public utilities commission to fill the vacancy caused by the death of Harper C. Rivers. Mr. Rivers served on the Exeter Commission for a period of 10 years prior to his death.

### Oshawa P.U.C. Names Assistant Manager

James Bruce Annand, an Oshawa engineer, who began work with the Oshawa Public Utilities Commission as a summer employee 16 years ago, has been named Assistant General Manager.

A Queen's University graduate, Mr. Annand served with the RCEME for five years, and was overseas in Britain and Europe from September 1941 until December 1945, returning to the Oshawa utility early in 1946.

## ARMCHAIR TOUR

(Continued from page 22)

locks at Sault Ste. Marie into Lake Superior and across 743 miles of angry water to the end of the line at Duluth — 1,677 miles from the Atlantic Ocean and 618 feet above it.

To those who were fortunate enough to see "The St. Lawrence Story," the experience was a thrilling preview of the benefits which Canada and her friendly neighbor to the south will share when the power project and the seaway become a reality within the next few years.

— by J. J. Kirkwood.

### London P.U.C. To Close 42-Year-Old Hydro Shop

London P.U.C. has announced that it will close the Hydro Shop in the City Hall in August this year. Operated by the London utility for the past 42 years, the premises will be leased for a period of 20 months at \$33,700 to the Bank of Montreal as a temporary site for its London City Hall branch during demolition of the existing branch office and construction of a new building at Dundas and Wellington Streets.

## FOR SALE

2—only Type EO, 400 VA, Comp-VA 25 cycle 13,800/115/115 volt Potential Transformers. Serial No. 176468-9 Wt. 4900 lbs. 14.2 Gals. Oil.

3—only Current Limiting Fuse Holder 34,500 volts Type BMRR-0 S/C Cat. No. 29964-S.

4—only 1 amp. High Potential S/C Fuse for above fuse holder.

Address inquiries to: S. E. Preston, Esq., General Manager and Secretary, Kitchener Public Utilities Commission, 191 King Street West, Kitchener, Ontario.

## ORCHIDS FOR ONTARIO HYDRO

(Ottawa Evening Journal)

**I**N THE annual report of the Power Authority of the State of New York there is this paragraph:

"We can report that the project (St. Lawrence Power Project) is on schedule and that the first power will be generated in September, 1958. Our partner in the development of power, Hydro-Electric Power Commission of Ontario, has been more than adequate for the task. Had they not carried on preliminary engineering designs and complicated hydraulic model studies, at least a year would have been lost in starting construction."

And in conclusion this:

"We are particularly appreciative of the steady, reliable and friendly aid received from Ontario Hydro . . . and the Canadian St. Lawrence Seaway Authority. Without complete accord among these agencies, the program would have bogged down. This project is an outstanding example of what can be done in the field of international partnership."

Our public bodies are so often subjected to attack, it is good to have from outlanders this tribute to one of the greatest of them.

And we may add this: Apparently the talk we hear of "tension" between the United States and Canada doesn't come from the people on both sides of the border who are really doing things.

### Brantford Township Takes Over System

Some 2,000 customers, formerly served by the facilities of Ontario Hydro's Brantford Operating Area, are now receiving power from the Brantford Township Hydro-Electric Commission. A substantial portion of the former Brantford Township voted area was annexed by the City of Brantford in January, 1955. At the last municipal elections, rate-payers endorsed a proposal to purchase all distribution facilities within the balance of the township being operated by Ontario Hydro.

As Ontario Hydro completed transfer of these facilities to the municipally-owned system a resolution from the local council expressed appreciation of the "fine way the Commission has always served the township."

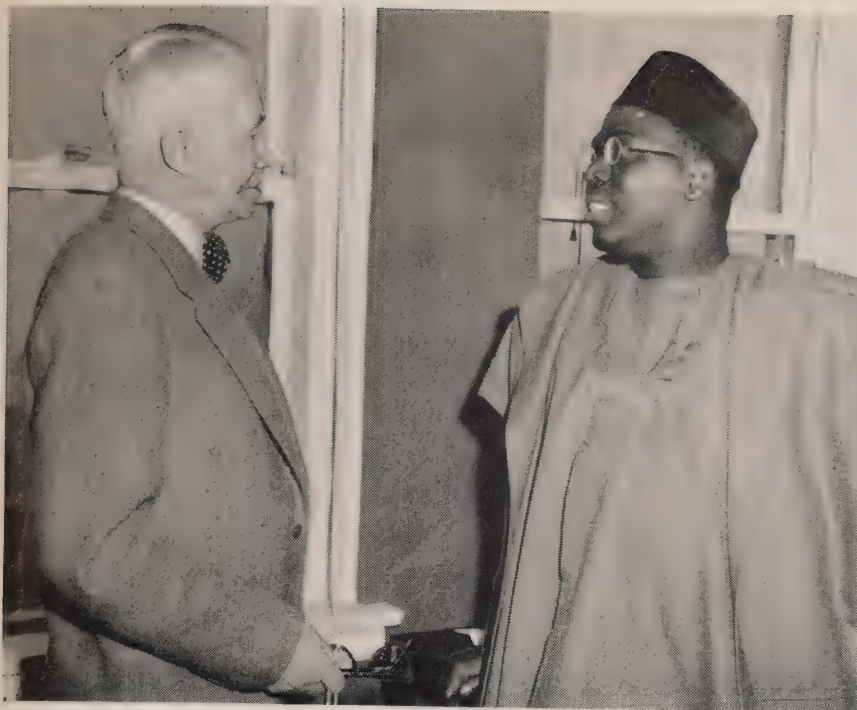
### Gatineau Power Company Opens New Headquarters

Hon. Romeo Lorrain, Quebec Minister of Public Works, officiated at the recent official opening of the new head office building of the Gatineau Power Company located in Hull, in the presence of a large gathering of official, religious and business leaders.

The new building will provide accommodation for the executive officers, the general administrative staff, the accounting, engineering and purchasing groups, and the division office staff which is being moved from its present location at 117 Main Street, Hull.

Gatineau Power Company supplies power to the Commission's Southern Ontario System.





## NIGERIAN GUESTS

ONTARIO Hydro, through its Chairman, Dr. Richard L. Hearn and other representatives, recently played host to Chief The Hon. Obafemi Awolowo, Premier of the Western Region of Nigeria, during a tour of the Niagara area. Accompanied by his private secretary and a representative of the Department of Information Service, Western Nigeria, and also R. R. Parlour, Area Officer (Commonwealth), Department of Trade and Commerce, Ottawa, the distinguished Nigerian official inspected the Sir Adam Beck-Niagara Generating Station No. 2, and made several other stops at points of interest in the Niagara district. Representing Hydro were Dr. Hearn, John Dibblee, Assistant General Manager, Personnel, and T. E. Dietrich, Manager, Services Department, Information Division. Dr. Hearn is shown in the photograph above with Premier Awolowo.

In acknowledging Hydro's hospitality, the visiting Premier subsequently sent the following letter from Milan, Italy, to General Manager A. W. Manby:

"It was indeed a great pleasure and an honor for my secretaries and myself to be your guests at the Niagara Falls. We did enjoy every minute of our stay there. We are very grateful to you and your Commission for all you did to make us comfortable and happy.

"I would like to thank you in particular for the trouble you have taken to fetch us from Toronto, and not only to bring us back, but also to wait at the airport and see us off on our journey to New York. This was an act of kindness and brotherliness I will not forget.

"Please convey my very warm greetings to all your colleagues, and in particular to the Chairman of your Commission."

## Prescott P.U.C. Moves To New Location

The Prescott Public Utilities Commission is now established in new headquarters, (formerly used as the Prescott Armouries). The present quarters provide space for offices, workshop and storage under one roof.

## KINCARDINE'S BIG BOUNCE

(continued from page 19)

from 200 to 250." President Runciman estimates, "and we expect, eventually to have some 450 Kincardine and district residents on our payroll."

### Good Labor Pool

Kincardine's position as a good labor pool was one of the main factors underlying the decision of the Yale company to locate in this community.

Yale executives also feel the wisdom of their decision was fully justified by the "exceptional" assistance provided by Ontario Hydro, Kincardine P.U.C. and Kincardine Town Council.

Company officials are prepared to give credit for much of their success in getting into production at such an early date to the efforts of C. E. Crease and W. Fred Silk, of Hydro's Georgian Bay Regional office, who have taken a particular interest in the operation, and to the Kincardine Public Utilities Commission under Superintendent Floyd Kellestine. The Kincardine P.U.C. uses a 7-man crew in its work for the municipality and has 911 domestic, 22 power, and 152 commercial customers.

"This industry," states Fred Silk, "is a great asset to the Town of Kincardine and surrounding district, and reflects the increasing trend of industry to locate outside the larger cities."

This opinion, judging by other comment, goes double for the entire community, where the economy has been given a big bounce by a rubber company. ■

# MEMORABLE MILESTONES



**O**NE OF Ontario Hydro's most significant achievements in the past half-century of service has been the development of the hydro-electric resources of the Niagara River. On December 28, 1921,

with Sir Adam Beck, the first Chairman, presiding, the Queenston-Chippawa Generating Station was officially opened by his daughter, Miss Marion Beck and Ontario Premier E. C. Drury during a 15-minute ceremony depicted in the top photograph. This plant (renamed the Sir Adam Beck-Niagara Generating Station No. 1 in 1950) with an installed capacity of 392,000 kilowatts in 10 units by 1930, was regarded as one of the world's largest hydraulic developments at that time.

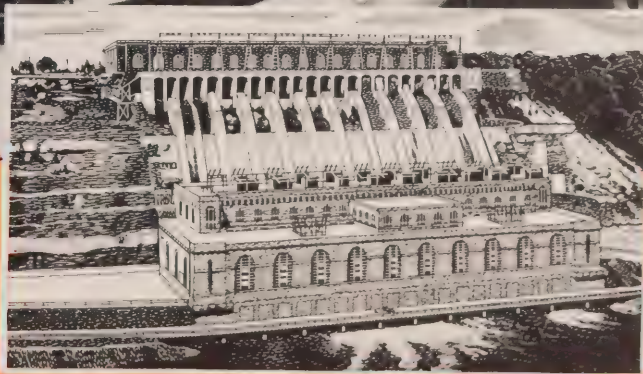
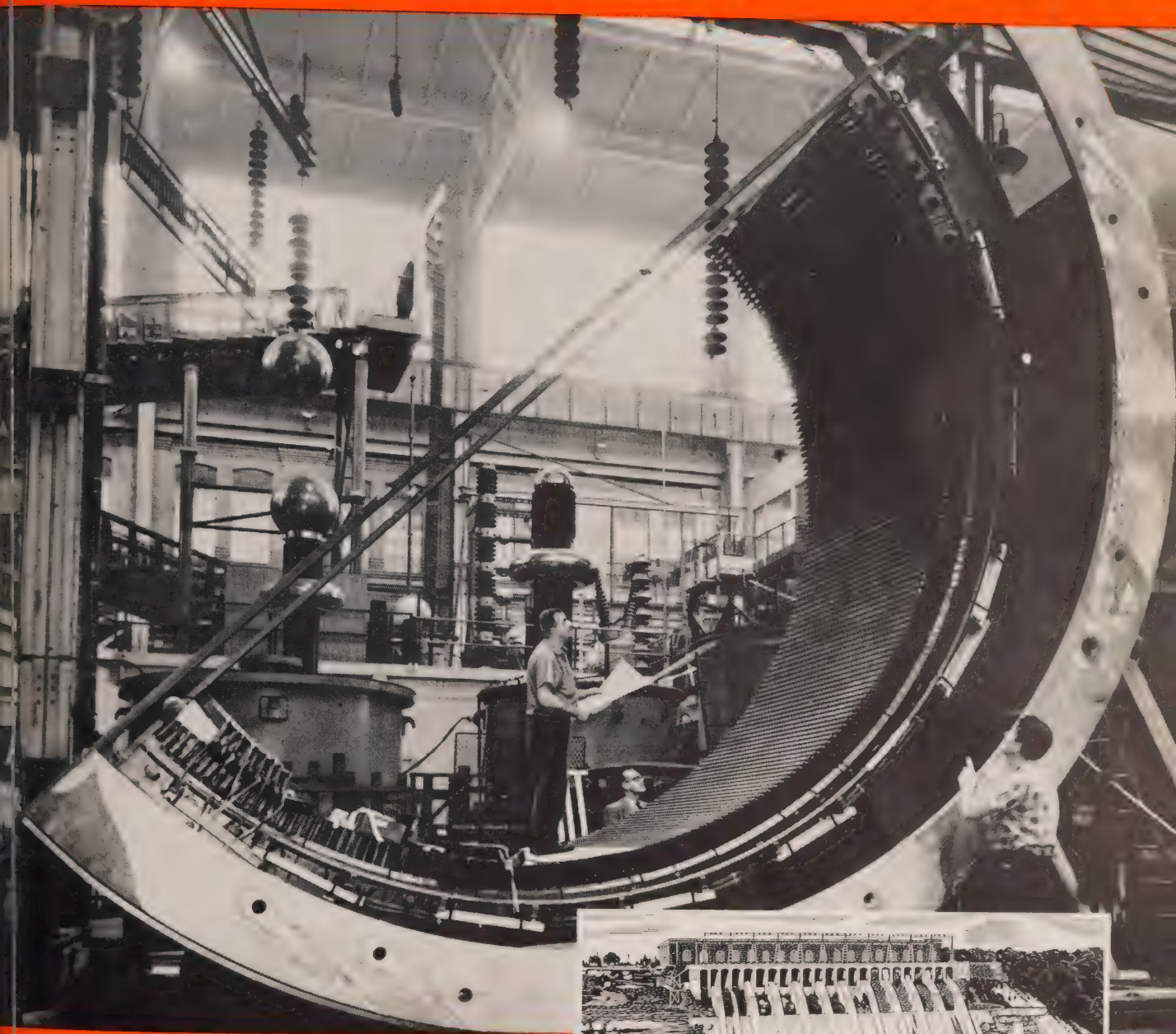
Another memorable event was recorded on August 30, 1954, when H.R.H. the Duchess of Kent officiated at the formal inauguration of the adjacent Sir Adam Beck-Niagara Generating Station No. 2. This mammoth project, with an ultimate installed capacity of 1,370,000 kw. is shown in the foreground of the lower photograph, with the older plant in the background.



ONTARIO HYDRO

*News*

JULY-AUGUST, 1956



POWER PORTRAIT

## ONTARIO HYDRO

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## A NEW RECORD

REASSURING evidence that Ontario is maintaining her position as the "production giant of Canada" is presented in the "Ontario Industrial Review, 1955," issued by the Trade and Industry Branch of the province's Department of Planning and Development.

In manufacturing alone, the province holds a dominating position in Canada, accounting for almost one-half of the total gross value of manufacturing production, approximately one-half of the employment and payrolls, and nearly one-half of the capital investment. Last year the gross value of manufactured goods passed the \$9 billion mark for the first time in history.

This new record reflects the confidence that industrialists have in the future of Ontario. A further expression of this confidence was the fact that 165 new industries were established in Ontario during 1955. This figure includes 45 of Canadian origin, the majority of which were new firms started by Ontario interests and Ontario capital; 57 from the United States; seven from the United Kingdom; four from Western Germany and two from other countries.

Reflecting the concerted efforts among Ontario's smaller cities and towns to attract new industries, the report points up the encouraging fact that 50 of these new industries were established in urban municipalities with a population of less than 35,000.

In addition 43 branch plants, owned by Ontario companies, started operations in new communities, while 350 major expansions were undertaken by existing Ontario industries during the same period. These expansions, as the Review points out "are most important since they represent between 80 and 90 per cent of the capital investment in new manufacturing plant and equipment."

This fact-filled report, in citing reasons for the high level of manufacturing activity in Ontario today states that population is the major contributing factor. A 32 per cent increase in the past 10 years has raised the province's population to a total of five and one-quarter million people (33 per cent of the total national population), constituting "the largest provincial population and therefore, in numerical terms alone, the largest provincial market in Canada."

Ontario also constitutes the richest market in Canada, according to this annual report, which stresses the significant fact that the personal income of Ontario's citizens has more than doubled in the last decade to reach \$7.9 billion in 1955, representing 40 per cent of the total personal income earned by Canadian citizens.

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## COVER SHOTS

REFLECTING the progress of Ontario Hydro's frequency standardization program, two 25-cycle units at the Sir Adam Beck-Niagara Generating Station No. 1 are being altered for 60-cycle operation. Our front cover photograph this edition shows a half-section of the No. 10 unit stator in process of fabrication at the Hamilton plant of the Canadian Westinghouse Company. The eight remaining units in the Niagara generating station — once regarded as the largest in the world — will continue to operate at 25 cycles for the present.

The back cover photograph recalls the contribution London's Western Fair has made in telling the Hydro "story" over the past half-century.



*Great Estates may venture more  
But little Boats must stay near shore.*

BENJAMIN FRANKLIN — POOR RICHARD.







◁ RECENT view from the air of Niagara's Horseshoe Falls showing improvements to both flanks carried out jointly by Ontario Hydro and the Corps of Engineers, U.S. Army.

pressure—was best suited to their needs.

### Commission Organized

So it was that Edward Dean Adams, President of The Cataract Construction Company at that time, carried the problem to Europe seeking engineering aid and advice. On June 21, 1890, a group of scientists gathered at Brown's Hotel in London, England and during that meeting The International Niagara Commission was organized.

Presiding as Chairman of this now-famous commission was the illustrious Lord Kelvin (then Sir William Thomson), while William Cawthorne Unwin, Professor of Engineering of the City Guilds of London, recorded the proceedings as Secretary. Other members were: Prof. E. Mascart, France; Lt. Col. Theo. Turrettini, Switzerland, and Dr. Coleman Sellers, United States.

This room—a private dining room in the select British hostelry in the centre of London's Mayfair district—has since become known as "The Niagara Room" and is so designated by a brass plaque on the doorway.

The records of the International Niagara Commission form an important chapter in the history of science and particularly of electricity, for the formation of the commission marked what is regarded as the first of several notable international conferences of eminent scientists for industrial purposes.

### Letter of Invitation

At that historic meeting in The Niagara Room in 1890, Mr. Adams, who has since become recognized as one of the pioneers and a guiding genius of Niagara hydro-electric development, presented to the new commission the draft of a letter of invitation (together with maps and plans to accompany the invitation). This invitation offered a series of

# SYMBOL OF POWER

**Formation of The International Niagara Commission in 1890  
was the prelude to a great era of hydro-electric development**

A GREAT writer once said that "art and science are not cast in a mould but are formed and perfected by degrees."

And so it has been with the creation of Niagara's vast power complex, which now comprises an impressive chain of Ontario Hydro and United States generating stations.

It is difficult—in fact virtually impossible—to determine the actual birthday of the Niagara generating systems. For many years, men had gazed in admiration and awe at the two cataracts, realizing their power potential, but the question of harnessing the energy of these waters

presented a perplexing problem.

Perhaps the first practical step was taken in 1886 with the formation of The Niagara River Hydraulic and Tunnel, Power and Sewer Company, which, in 1889, adopted the less ponderous title of The Niagara Falls Power Company. In that year this company made contracts with The Cataract Construction Company for construction of a hydraulic project at Niagara Falls.

But even with this decisive move, the power pioneers of Niagara were unable to determine what type of development—power from electricity, compressed air or water under



prizes "for the best practicable engineering scheme of a project for the development of transmission and distribution of about 125,000 effective horsepower on the shafts of motors at the Falls of Niagara." At the third meeting of the commission on June 24, 1891, the final draft of the invitation was approved for distribution to 28 firms or individuals in the following countries: America — 5; England — 7; France — 9; Switzerland — 6, and Hungary — 1.

The invitation brought an encouraging response from 17 participants, although only 14 entries were considered. Reaching a final decision on February 4, 1891, after several seven-hour daily sessions, the commission announced eight awards for four pneumatic projects and an equal number of electrical projects.

Entries from Switzerland, Germany, France, England and from the United States qualified for the prizes.

The highest prize was awarded for a hydraulic development producing electricity, which had been submitted jointly by Messrs. Faesch and Piccard, and Cuennod, Sauter and Co., both of Geneva.

Subsequently, the Niagara Falls Power Company made a contract with Faesch and Piccard for complete working drawings of a 5,000-horsepower turbine and governor. The entire turbine installation of 10 units of 5,000 hp. each in one of the company's powerhouses at Niagara Falls was manufactured in America from these same drawings.

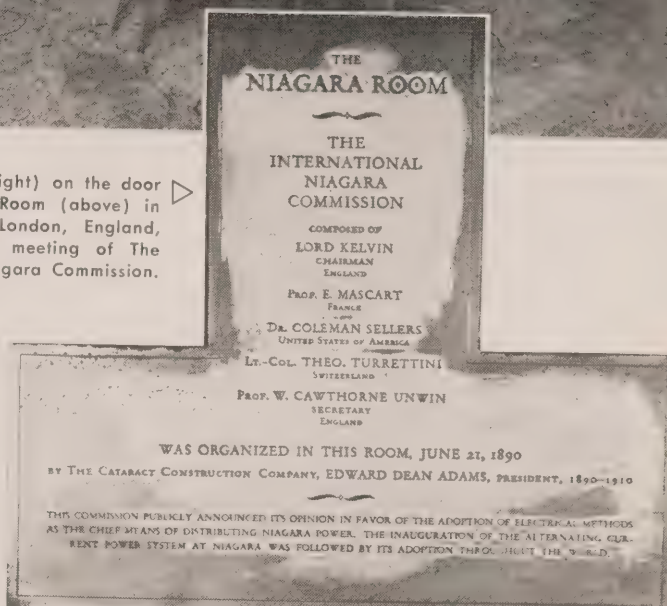
The decision of The International Niagara Commission to recommend "the adoption of electrical methods

*(continued on page 31)*

DURING a recent visit to Great Britain, Hydro Chairman Dr. Richard L. Hearn (centre) made what he termed "a pilgrimage" to the Niagara Room with George D. Taylor, Public Relations Officer, Ontario House, London (left), and James P. Armstrong, Agent General for Ontario in the United Kingdom.



△ THIS PLAQUE (right) on the door of the Niagara Room (above) in Brown's Hotel, London, England, recalls the first meeting of The International Niagara Commission.



# BECK – THE MAN

by E. V. Buchanan, P. Eng.

This profile on Sir Adam Beck by Mr. Buchanan, former General Manager of London Public Utilities Commission, does not follow the traditional lines of a formal biography. Calling upon a background of a long acquaintance with the first Hydro Chairman — at the request of *Ontario Hydro News* — Mr. Buchanan herewith presents an account of several personal experiences with this great man. These recollections strikingly illustrate the vigorous but complex character of the “Hydro Knight” and his unswerving devotion to Ontario’s public power enterprise and to many causes, which have left an indelible imprint upon Canada and his native province. (Editor’s note.)

MONUMENT to Sir Adam Beck  
on University  
Avenue in Toronto.





**I** FIRST met Adam Beck in 1910.

Previously he had been an alderman and Mayor of London. In the latter capacity he was a member of the Board of Water Commissioners. In 1908, when the engineer of the water commissioners recommended that London augment its spring water supply by taking water from the river, Beck stepped into the discussion by suggesting that a much more wholesome supply could be obtained from artesian wells. When he realized that the commissioners would not entertain his proposal he went before the city council and offered to take the contract for drilling wells, building a reservoir and pumping station, and delivering 1½ million gallons of water a day for \$100,000 on a "no-water-no-pay" basis. The council had no alternative but to put the proposal to a vote of the people and this carried by a large majority.

The wells actually produced on test over two million gallons a day. Beck's out-of-pocket expenses amounted to over \$106,000, but the city council held him to his contract and Beck was never reimbursed for the extra \$6,000.

It was during the construction of the artesian wells plant that I was sent to London as resident engineer on a combined electrical substation (London's No. 1) and pumping station.

### First Meeting

Until this time I had never encountered Adam Beck, but walking home one evening with one of London's prominent citizens whom I had just met, he left me by saying "Good night, I'm glad to have met you but sorry you are involved with that crook Beck." This was the beginning of my realization that Adam Beck was a highly controversial figure.

Next morning I asked the superintendent on the job — an old London citizen, "Why is Adam Beck a crook?" He asked who had given me this information. When I gave

the name he laughed heartily. He then told me that criminal charges of corrupt practices in a federal election had been brought against my friend of the previous evening. This personage blamed Beck for instituting the action, and, until the end of his days, this man hated Beck most violently.

It was only a few days later that Beck visited the job. He approached me brusquely and demanded to know who I was and all about me. He ended his conversation by saying "Well I suppose Scotland is a good place to come from!"

He visited the job frequently and had to inspect everything closely. He had a most keen sense of observation and nothing missed his sharp eye. As I accompanied him around the work he would peremptorily issue instructions. Being young and brash, I frequently refused to comply with his demands, which made him very angry. I was later to realize that it was this attitude that made one more acceptable to him. I found out that he despised the "yes-men" and the many people, who "kowtowed" to him.

Beck usually came home from Toronto on Friday afternoon and returned on Monday evening. It was during these weekend visits that I got to know Sir Adam intimately. He would have me meet him at the train or drive him to the station. After Lady Beck died, and his daughter, Marion, was out of the city attending school, he would call me up Sunday mornings to come over and have breakfast. He was a lonely man in these days and wanted someone — as I put it — "to talk at."

I am afraid these Sunday morning breakfasts did not endear me to the Hydro staff. In conversation I would rashly make some suggestions to which Beck would say "Nonsense, you don't know what you are talking about." Then after his return to Toronto, Fred Gaby (Ontario Hydro's Chief Engineer for several years) would call me up and ask me to tell him more



IN 1922, this group, left to right: Mr. Buchanan, author of this article; Sir Adam Beck, E. S. Little, Mayor of London, and W. Y. Yendall, then President of London Chamber of Commerce, visited Hydro's new Queenston-Chippawa development (now the Sir Adam Beck-Niagara Generating Station No. 1) after this plant started operation.

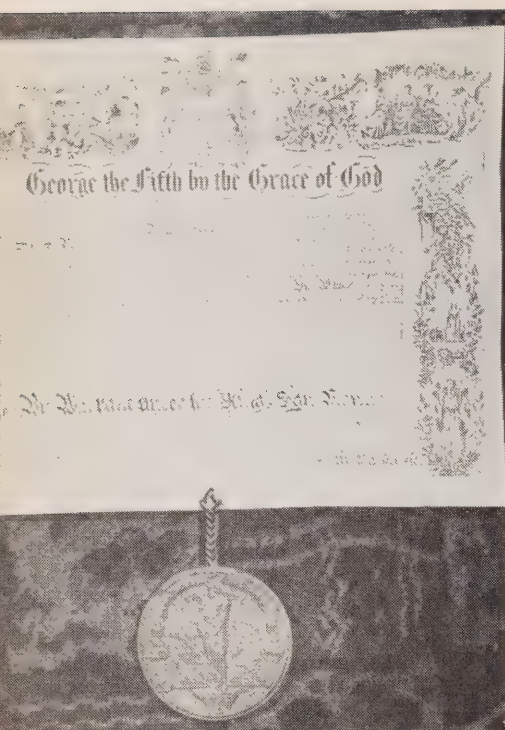
about what I had proposed to Sir Adam. When I visited the offices in Toronto, the Secretary of the Commission, Major W. W. Pope would chuckle and say "Here comes Beck's bad boy." Frequently on Sunday mornings, we would drive after breakfast to the Queen Alexandra Sanatorium (now The Beck Memorial Sanatorium), which he and Lady Beck had founded with large contributions of their own out of gratitude for their daughter Marion's recovery from tuberculosis.

### Christmas Rush

He and Lady Beck had devoted a great deal of their time to this institution, Sir Adam with his usual efficiency and desire for nothing less than excellence. He had promised the sanatorium that it would be lighted by Hydro by Christmas, 1910, which seemed impossible, but, of course, was accomplished. This was perhaps my most memorable Christmas eve. Beck, to make sure

*(Continued on page 6)*





the job would be finished, rode around all day on one of his favorite horses, while the line gang with wagons and sleighs, the superintendent and I in a cutter, completed the job and switched on the power about 6 p.m.

This is a simple little illustration of Beck's outstanding characteristic. When he made up his mind that he wanted something done, it was done. I recall him telling once that Premier Whitney had said that a certain thing could not be done under the existing law. He said that he had told Whitney to see that the law was changed at once.

Beck had many sides to his character. To all but his most intimate friends he appeared to be callous and ruthless. I discovered on several occasions that this attitude was only a veneer. One morning at breakfast he said: "I have no friends, I have had to fight tenaciously every inch of the way for Hydro, so that fighting has become my second nature and I fight with my friends needlessly and lose them."



△  
◁ RECALLING the brilliant career of Hydro's first Chairman are the mementoes depicted in these photographs, including the warrant for his knighthood conferred in 1914 (left). The collection above comprises various illuminated addresses presented to Sir Adam; leather-bound volumes containing messages of sympathy to his daughter, Marion, after his death in 1925; his personal copy of Ontario Hydro's first annual report and other important Hydro souvenirs.

Another incident that illustrates the difficulty he had in showing any kindness or gratitude occurred when I gave an address to the Rotary Club on the London water supply in which I told of the great success of the artesian wells scheme inaugurated by Beck at his own risk. After the meeting, at which Beck was present, he asked me to drive him home. When he alighted, he stood with his foot on the running board, talked of many things and then "hummed and hawed." Finally he blurted out: "Thank you very much for what you said about the wells." With that he pulled out his handkerchief and wiped the tears from his eyes, and saying, "Oh damn it all," dashed into the house.

When Beck set up the London Health Association to operate the sanatorium, he did not worry too much about finances. Philip Pocock, for many years Chairman of the Public Utilities Commission of London and a staunch supporter of Beck, although on the opposite side of the political fence, told me that one day, among a group of prominent business men, Beck announced that the "San" was overdrawn at the bank by \$10,000 and that he wanted their signatures on the note. The group immediately vanished

leaving only Pocock, who said that he would sign the note. Beck with tears in his eyes said, "I'll never forget you for this Philip."

At the opening of the Marion Beck Nurses' Home, donated by Sir Adam and Lady Beck at a cost of over \$25,000, Sir Adam in making the presentation was overcome by emotion. Lady Beck had to step forward and continue the address.

One winter evening coming from Toronto on the train, Sir Adam said, "Look out there!" With obvious emotion in his voice he said: "The lights in the farms. That's what I've been fighting for."

### Called an Autocrat

Beck was called an autocrat, and perhaps he was. He was a man who had absolute faith in his own judgment. He never failed, when speaking publicly, to praise his young Canadian engineers, who had designed and built Hydro. But he often overruled them. I recall going to his office in Toronto about a controversial London Waterworks matter in which he had taken an interest. He had asked for a report on this from one of the Hydro engineers and asked him to bring it while I was there. Beck read the report, tore it up, threw it in the wastepaper basket and said "That's not





△ AERIAL VIEW of The Beck Memorial Sanatorium on the outskirts of London founded by Sir Adam and Lady Beck in 1910. Formerly the Queen Alexandra Sanatorium, this widely-known centre for tuberculosis treatment was renamed in 1949 at the suggestion of Mr. Buchanan.

PROFILE of the "Hydro Knight." ▷



what I want, go and do as I told you."

I like to think of Beck as a benevolent dictator. He was an idealist. His idea of Hydro was translating the natural water resources of the province into better living conditions, convenience and comfort in the home, the farm, the office and the factory. But he thought more of people in the mass rather than of individuals. He had little or no interest in the desires or ambitions of a person. I overheard him once, in his London office, giving someone a scathing "dressing down" for suggesting that he should be rewarded for his support of a political party. He expected all his friends and followers to be as selfless as himself. The exception to this side of his character was when sorrow overtook one as I had reason to know from personal experience.

Sir Adam was humorless. I never heard him make a joke, but his wit was keen and biting. For example at a meeting of the London Railway Commission, of which he was Chairman, the Mayor of London demanded an explanation of a newspaper headline, in which Sir Adam was quoted as saying that "the Mayor is a pin-head." In answer to the demand that he apologize,

Beck looked down at the agenda before him, as if carefully considering his reply, and then said, "Yes, Mr. Mayor, I believe I was correctly quoted, but I did not mean that your head was literally the size of a pin's head, but I did mean that it could not possibly contain any brains. Let's go on with the meeting."

In spite of all his apparent lack of sympathetic feelings, he had the faculty to inspire loyalty in those around him. He made them believe that theirs was not only a job but a cause. I am sure that this inspired devotion of the staff, created by Sir Adam, has permeated the whole organization, and the success of Hydro, even to this day, depends to no small degree on it. When I had an offer to go to Brazil, I mentioned it to one of the Hydro engineers and he said, "You can't do that Buchanan, you can't leave Hydro," implying that I was renouncing my god.

Sir Adam was absolutely honest. Everything he did was open and above board. He was the foe of the grafter and the "wire-puller." A man of his calibre was needed at a time when so many transactions, involving large sums of money, were in progress. One evening in November, 1920, I met Sir Adam at the

station. He was in great form, he was jubilant. He told me that he had just completed the deal to buy out the Mackenzie power interests for \$33,000,000 after 10 years relentless war. On the other hand his salary as Hydro Chairman was small, his own business, the Beck Manufacturing Company was neglected and he died a comparatively poor man.

I have mentioned his gruff and harsh exterior and the sensitivity under this veneer. He was also a temperate man in his living. He only drank liquor on the most formal occasions. He seldom swore and he detested any form of vulgarity. I recall him expressing his strong disapproval of a floor show at one of the Hydro conventions.

#### Enjoyed Manual Work

He took a boyish delight in doing ordinary manual jobs, often to the embarrassment of employees. He would, on occasion, sweep up the picnic trash on a London and Port Stanley train, and shovel snow at the Sanatorium. One Sunday when the engineer there had trouble with the boiler feed water pump, he took off his coat and proceeded to take the pump apart, all the time berating me as a poor mechanic.

(Continued on page 8)





ALTHOUGH Adam Beck spent the greater portion of his time in Toronto after formation of Ontario Hydro in 1906, he regarded the family residence, "Headley," at London as "home."

Another incident demonstrating his liking for the out-of-doors was an early break-up of the ice on the Thames River, which caused an ice jam near Delaware, threatening to result in serious flooding. He got the latest report on the situation, while at breakfast on a Sunday morning, and sent for two of

the Hydro construction men with dynamite and detonators. We all drove to the scene of the jam and proceeded to set off charges in an attempt to dislodge the ice. When lunch-time approached, he sent me to the village to find the storekeeper and buy bread, butter, cheese, sardines and milk. We all

sat on a log, amid the snow and ice, while Sir Adam told us about his early days with his father and his millwright business. When we left later in the day, the ice had moved but little, but all had enjoyed a good day's outing—especially Sir Adam!

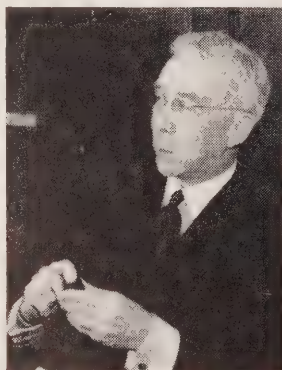
The attacks of the anti-Hydro, anti-Beck factions never ceased, and Sir Adam's successful efforts to confound those enemies began to take their toll on his health. He was obviously not well. But, with his indomitable will, he had worked day and night in the cause of Hydro. When I was in Toronto, Sir Adam would, occasionally, ask me to stay overnight in his Queen Alexandra apartment next to the Hydro building. I remember once, waking between 3 and 4 a.m., seeing him in his pajamas with a pile of papers on the living-room table. At breakfast when I remonstrated with him, his only reply was that he could do his best work then.

At last he went to Johns Hopkins

*(Continued on page 29)*

## ABOUT THE AUTHOR

Edward Victor Buchanan, General Manager of London Public Utilities Commission for 37 years, is a native of Hamilton, Scotland, and a graduate in electrical engineering from the Royal Technical College, Glasgow.



E. V. BUCHANAN

On November 30, 1910, he was present when Sir Adam Beck inaugurated Hydro service for the City of London, becoming General Manager of London P.U.C. in 1915, a position he held continuously until his retirement on January 1, 1952.

An intimate friend of Sir Adam until the latter's death in 1925, Mr. Buchanan recalls that it was the "Hydro Knight," who was instrumental in sending him on an extended tour of Europe, where he made a close study of power developments after the First World War.

Keenly interested in civic enterprises, the Scottish engineer, as Honorary Secretary of the London Health Association, suggested that the Queen Alexandra Sanatorium be renamed The Beck Memorial Sanatorium — a suggestion that was adopted in 1949.

Active in engineering circles, Mr. Buchanan has been Vice-President of the Engineering Institute of Canada; President of the Association of Professional Engineers of Ontario, and a member of the Canadian Section of the American Waterworks Association. He was recently presented with a certificate from the Canadian Section and a life membership from the parent association (see *Ontario Hydro News* — June, 1956). In recognition of his achievements in the field of engineering, Ontario Hydro, in 1950, renamed its Westminster Frequency Changer and Transformer Station in his honor. This important plant is now known as the E. V. Buchanan Transformer Station.

Included among his present interests are the London and Suburbs Planning Board of which he is Chairman, and the University of Western Ontario, which has appointed him to two advisory committees. He is also President of The Beck Memorial Sanatorium.





# Accent on ACCOUNTING

Fifth Eastern Ontario A.M.E.U.  
Conference Draws Record Attendance



△ MEMBERS of this group, left to right, A. S. Auld, Oshawa; I. D. C. Thompson and K. C. McCaig, Kingston, and William Norris, Napanee, were loath to divulge whether they had been discussing fishing or accounting before the photographer noted them chatting together.

**W**ARM sunny weather and beautiful scenery co-operated to provide the perfect setting for the fifth annual Accounting and Office Administration Conference of the A.M.E.U.'s Eastern Division on June 14-15.

Held at Gananoque for the second successive year, the conference was highlighted by an informative program. Following registration, many delegates, including several ladies, enjoyed a two-hour cruise on the St. Lawrence River among the 1,000 Islands as guests of Kingston Public Utilities Commission.

Gananoque Mayor Clair Walker welcoming delegates at the evening

banquet in the Gananoque Inn, said "This is the second time you have come to Gananoque, and we hope it will get to be a habit."

Taking Mayor Walker's suggestion seriously, delegates approved the selection of Gananoque as the venue for the 1957 conference.

Guest speaker E. J. Benson, C.A., who combines the roles of partner in a firm of chartered accountants and Professor of Commerce at Queen's University, Kingston, discussed "Accounting—An Art or Science?"

In an objective approach to his subject, Mr. Benson quoted definitions by John Stuart Mill, Noah

Webster, and a remark on accountants by the English essayist, Charles Lamb — names not usually associated with a subject like accountancy.

Mr. Benson pointed out that accountancy was responsible for the virtual abandonment of Roman numerals in the eleventh century, and the adoption of Arabic figures to facilitate the recording of monetary transactions, while double-entry bookkeeping was introduced in response to the requirements of business in the 15th century. "Urgent business necessity" he stated "was the mother of accounting, and maternal love has guided its development."

## Accountants Isolated

Remarking that recording and accumulating accounting and statistical data is a field in which the accountant has operated for many years, Mr. Benson said the performance of these tasks has often isolated the accountant, to some extent, from the engineering and management functions of the business.

"Progressive management," he declared, "now demands that he come out of this vacuum and join with engineers, salesmen and management in planning for the future."

Rounding off a varied program, entertainment was provided by Mrs. Evelyn Johnson, musician, mimic and comedienne.

Delegates also visited the head-

*(Continued on page 10)*



quarters of the famous Gananoque Canoe and Motor Boat Club, where delegates enjoyed a magnificent color film provided by courtesy of the Canadian General Electric Co. This traced the history of the St. Lawrence River from the glacial age to the present era, showing construction of Ontario Hydro's St. Lawrence Power Project.

In another phase of the conference, H. T. Macdonald, Internal Auditor, Ontario Hydro, discussed uniform accounting for municipal electrical utilities.

Pointing out that the first manual on uniform accounting was issued by Ontario Hydro in March, 1911, and revised in July, 1915, Mr. Macdonald said it was essentially an adaptation of the accounting system, which had been practically standardized by the Interstate Commerce Commission of the United States and by the most prominent of the public utility bodies at that time, notably New York and Wisconsin.

An Ontario Hydro committee of three is now studying revision problems, the most recent meeting of this body having taken place on June 8, 1956. It is the intention of the committee to meet with accounting committees of the A.M.E.U. and keep them informed of accounting manual revision proposals, Mr. Macdonald stated.

#### Rates Discussion

Hydro rates, a matter of great importance to utilities in general, and accountants in particular, caused delegates to follow with close attention a talk by Hydro's Rate Study Engineer, A. W. Murdock, on "Our New Resale Rate Structures."

Illustrating a closely-reasoned and interesting address by means of graphs, he said the new structures have been approved by the Commission and the A.M.E.U. Rates Committee. Schedules covering the range of revenue requirements have been prepared. Considerable flexibility is to be permitted when the structures are being



W. CARON JONES

ONTARIO Hydro's Staff Psychologist discussed "Your Job and Human Relations" following a luncheon at this year's conference.



E. J. BENSON

KINGSTON chartered accountant and Professor of Commerce at Queen's University spoke on: "Accounting — Art or Science?"

NATURALLY accountants are interested in new types of accounting equipment. The group, left to right, Misses Beatrice Porter and Shirley McVeigh, Galt, and Miss Blanche Detlor, Deseronto, examines a new billing machine, which was on display during the two-day conference.





introduced, and the following procedure has been approved:

1. The new structures are to be introduced in individual municipalities as changes in existing rates are required;

2. In municipalities where a shift from the existing to the new structures in one step might produce rather extreme changes to individual customers, the shift may be made in more than one step with an appropriate interval between changes;

3. If the use of energy by domestic customers in any municipality does not warrant a four-step rate, a three-step rate may be adopted;

4. The present policy of obtaining a municipality's concurrence before rate changes are presented to the commission for formal approval is to be continued.

Copies of an eight-page summary of the municipal resale rates situation, made available by Mr. Murdock, were eagerly received by delegates.

Reflecting a growing awareness of the complexities and importance of human relations, as distinct from public relations, was a luncheon address by W. Caron Jones, Ontario Hydro Staff Psychologist. The speaker, making plain his view that the practice of applied psychology was in the infant stage and the last word on the subject was still far away, suggested that an employee's feelings rather than his words should be considered. Of interest were phrases quoted by employer and employee to describe attitudes:

Employer	Employee
Loafing	Resting
Insubordination	Saving face
Failure to co-operate	Lack of skill
Disregard of company property	Accident
Unwillingness to do full day's work	Unwillingness to do job that can't be completed before end of day

Stating that harmful emotional tensions have become increasingly prevalent, it was suggested that these are due, largely, to changes in the nature of work during the past half-century. Specialization, for instance, implies fragmentation of the work process, which results, for the worker, in loss of meaning, loss of satisfaction and loss of pride. Conditions of stress are apt to result in frustration, which induces aggression, destruction, resignation and apathy, and in time the worker becomes anti-social, childish and stubborn.

### Human Ego

On the other hand where the importance of the human ego is taken into account, and incentives are supplied in the form of praise, reward and the consciousness of being an element in a progressive job, the worker's motivation is altogether happier.

Rest periods were defined, not as

concessions, but as a means to greater efficiency, while it was suggested that boredom, or psychological fatigue could be reduced by setting sub-goals: hourly quotas decided by the workers themselves; breaking up lengthy tasks; introducing variety, and expediting the completion of work by avoiding interruption of tasks or turning over certain uncompleted tasks to other members of a staff.

Responsible for arrangements at the conference, considered to be one of the best ever held, were: Chairman, R. E. Ainsworth, Lindsay; Secretary-Treasurer, Evor Leonard, Cobourg; Committee: W. T. H. Shouldice, Ottawa; Floyd McRae, Brockville; John M. Campbell, Gananoque; James L. Cochrane, Belleville; Aaron W. Hume, Belleville; D. G. Harrington, Morrisburg; J. C. Saunders, Ottawa; Harry Hummell, Chesterville. Advisory Committee: J. G. Ritchie, Belleville;

*(Continued on page 29)*

SMILING faces in this group indicate that registration formalities were comparatively painless for, left to right, Ralph McDonald, Wellington; Frank W. Gomer, Ontario Hydro; R. E. Ainsworth, Lindsay, and A. W. Hume, Belleville. Registration duties were capably handled by James Cochrane, Belleville (second from right), Miss Nadine Muchmore, Morton (seated).



# NAPANEE:

## The Town of the Triple 50

by W. T. Delworth



**N**APANEE, a busy eastern Ontario municipality, might aptly be described this year as "The Town of the Triple 50."

The first "50" is the Golden Jubilee of Ontario Hydro, Napanee P.U.C. being one of the 343 associated municipal electrical utilities throughout Ontario celebrating this important milestone. In addition, 1956 has a special local significance for this picturesque town as it marks the 50th anniversary of the establishment of Napanee's first publicly-owned electrical system. Associated with this municipal enterprise since its inception, Charles A. Walters, Secretary and Manager of the Napanee Public Utilities Commission, can look back with satisfaction upon the completion of 50 years' continuous service as the Manager of the local utility.

Located just north of the Bay of Quinte in the heart of one of Ontario's main United Empire Loyalist settlements, Napanee is a pleasant and friendly community whose appeal is firmly rooted in the early history and traditions of this province. With its quiet residential streets flanked by tall trees and stately red brick homes of Victorian design, the town has an aura of old-world charm that is all too sel-

dom found in many of Ontario's larger and younger communities.

Napanee's most obvious link with the past is provided by its name, which, like many other place names in Ontario, is of Indian derivation. While there is little evidence to indicate a permanent Indian settlement in this area, the Falls in the river, around which the town has developed, was given the name "*Appanea*" by the wandering tribes of southern Ontario. And although Champlain, most famous of the early explorers of Canada, visited this region as early as the autumn and winter of 1615-16, more than 150 years were to elapse before the first permanent settlements began to take shape. Following the American Revolution, the United Empire Loyalists fled northwards to carve out new lives and homes for themselves under the British Crown. To meet the needs of the new Loyalist communities, it became necessary to establish mills to grind grain and to turn logs into more finished types of lumber.

Prior to the arrival of the Loyalists, there was only one mill in this part of Upper Canada. Located near Kingston, it had been built by the government in 1782 or 1783. But about 10 years later, when the Loyalists arrived on the shores of the Bay of Quinte and settled the area around Napanee, the Kingston mill proved too remote to be of much practical value. Realizing the handicaps and inconveniences of this situ-

ation, the government decided to build a second mill to serve the new communities west of Kingston. The most suitable site was, of course, at Appanea Falls, which provided an excellent source of power. The mill proved very successful, and as the pioneer settlements became more firmly established, its business increased, and it became a flourishing enterprise.

It was purchased in 1792 by Hon. Richard Cartwright, the progenitor of one of Ontario's most distinguished families, and shortly thereafter it was rebuilt to meet the expanding needs of the thriving community. "The Big Mill," as it came to be known, remained in the possession of the Cartwright family until its purchase in 1911 by the Seymour Power Company.

### Prominent in Politics

In addition to contributing to Napanee's economic development, the Cartwrights played a prominent part in Canadian politics. Perhaps the best known scion of this family was Sir Richard Cartwright, grandson of the "Big Mill's" first owner, who represented Lennox and Adington at Ottawa for many years, and who, in the course of a long political career, held the important post of Minister of Finance and later, the Trade and Commerce portfolio.

As if to prove its neutrality in its associations with the "greats" of Canadian politics, Napanee boasts

*(Continued on page 14)*



Marking Ontario Hydro's Golden Jubilee this year, flourishing community also celebrates half-century anniversary of its publicly-owned electrical system under the management of Charles Walters



AERIAL VIEW OF NAPANEE'S MAIN STREET AND GIBBARD FURNITURE SHOPS, LTD., THE TOWN'S OLDEST INDUSTRY.



NAPANEE'S association with United Empire Loyalist traditions is reflected in the architecture of many of its public buildings, such as the Lennox and Addington County courthouse, built during the 19th century.

of a connection with Sir John A. Macdonald, first Prime Minister of the Dominion of Canada, whose political colors were at the opposite end of the spectrum from those espoused by the redoubtable Sir Richard. As a young man, the immortal "John A." practised law in Napanee for about three years before his political career began. And significantly enough, the last election speech made by the jaunty Sir John was delivered in Napanee in the election campaign of 1891, which cost him his life. Among the Prime Minister's audience that winter day early in 1891, was a 12-year-old schoolboy named Charles Walters who, if he has never electrified the citizens of Napanee with his political rhetoric, has played a part of singular importance in the electrification of their homes and industries, as well as the farms of the surrounding countryside.

But while the political storms of the 19th Century swept across the province, the economic development of Napanee continued at a remarkable pace. As local mills flourished, the town became the most important grain market between Toronto and Montreal; grain boats from the United States crowded into the small harbor to pick up cargoes of Canadian grain for transportation across Lake Ontario to Oswego, N.Y.

The early success of these first commercial ventures can be traced directly to the availability of power derived from the spectacular falls around which the town has grown up. For almost a century before the advent of electricity, power from these rushing waters provided the motive force for the mills and industries of the town.

With the passing of time all this has changed. As the hinterland of



Napanee ceased to be an important lumbering and grain-growing district, and as the United States ceased to be a profitable market for Canadian grain, the mills and elevators on the river gradually passed out of existence, marking an end of an economic era in the history of Napanee and of the province as well. Today, the only power derived from the falls is used for operation of the town waterworks system.

Interestingly enough, the water facilities, for which "Charlie" Walters is responsible as Manager of the public utilities commission, is located in the same building, which housed one of the first electric generators supplying power for Napanee's street lighting.

With the installation of street lighting, the history of Napanee's electrical services began. Although the town's streets were first illuminated by kerosene lamps, advances in the techniques of adapting electricity, led to the replacement of these rather primitive lights by 23 arc lamps, and to provide the necessary power, a direct current generator was installed at the "Big Mill." This enterprise was organized

in 1885 by the Cartwright family under the name of the Napanee Water and Electric Light Company. Subsequently, the generator was moved into the specially-built structure adjacent to the Cartwright mill, which is the present location of the Napanee waterworks plant.

About 10 years later, in 1895, John R. Scott built a small power development, consisting of a dam and powerhouse for a 100-horsepower alternating current generator, on the Napanee River at Camden East, about seven miles northeast of the town. This station supplied the first incandescent lighting for domestic and commercial purposes.

Coincident with the building of the Camden East plant, the Napanee Water and Electric Light Company, which had been supplying power for street lighting only, installed a small alternating current generator at its station adjacent to the mill, and for a time the town had two competing systems supplying service on a flat rate basis of 25c a month for each 16-candle-power lamp. Satisfactory for a time, these competing services began to deteriorate gradually in the early





APPANEA FALLS (right), from which the town derived its name, furnished power for Napanee's first mills and industries. In 1895 J. R. Scott built a small power plant (above) on the Napanee River, about seven miles from the municipality, which supplied alternating current for the first domestic lighting.

years of the new century, partly because of the growing popularity of gas lighting. By 1903, the situation became critical and the town was entirely without street lighting for two years.

### Special Bill

Faced with this failure of private interests to meet the needs of the community, the town decided to build a steam generating plant and operate it as a municipal enterprise. In July, 1905, Bylaw No. 718 of the Town of Napanee was passed, authorizing construction of an electric generating plant at a cost of \$35,000. However, this project aroused such opposition that a special bill had to be passed by the Ontario Government to confirm the Napanee bylaw. Mr. Walters, who had been placed in charge of this municipal enterprise, vividly recalls going to Toronto in connection with this matter and hearing Adam Beck speaking very forcefully at a session of the Private Bills Committee at Queen's Park. Thanks very largely to the ardent champion they had found in Beck, the Town of Napanee won their case and the necessary bill was passed early in 1906.

With these obstacles out of the

way, the new station was pushed forward to completion, work having begun in 1905. The site chosen was an old brewery and this had to be rehabilitated for the installation of the steam boilers and the generating equipment. Under the capable supervision of Mr. Walters, rapid progress was made on this undertaking, as well as on the construction of the appropriate distribution system. In September, 1906, the new plant was placed in service. Its two, 150-horsepower generators provided a night service only, and a street lighting service, operating on a moon-light schedule.

In 1911, the town accepted the Seymour Power Company's offer to purchase the plant and so supply a 24-hour service. The steam plant was subsequently dismantled and the company built a line to Napanee to supply power from other generating sources. This arrangement continued until 1916, when Ontario Hydro took over the operation of the Seymour Company's system. Finally, in 1930, the town purchased the system from Ontario Hydro, issuing 20-year debentures in payment, and signed a standard cost-contract with the Commission for a supply of elec-

tric power. The fact that these debentures were all paid off in nine years is a tribute to the sound financial management of the Napanee Commission.

The history of Napanee's electrical services is thus a varied one indeed. However, in this varied history, one factor is constant, and that is the continuous service of Charles Walters, who has held the post of manager through all the changes in ownership.

But changes in ownership are not the only ones which have taken place in the Napanee system over the years. The total load was only 690 kilowatts when the local commission took over the operation of the system in 1930, while, at present, it is 2,700 kilowatts, supplied by two substations, one at Napanee and one at Odessa. Today, there are 32 employees on the staff, some of whom have been with the commission since it was formed. And although Mr. Walters still holds the record, his long-service tradition is apparently being carried on by his able staff. George Reid, assistant to the manager, and Ed. Loucks, line

*(Continued on page 16)*



superintendent, have both been with the commission since 1930. Miss Leah VanAlstine, chief clerk, has been an employee of the Napanee P.U.C. for about 33 years and Miss Ruth Graham for over 25 years.

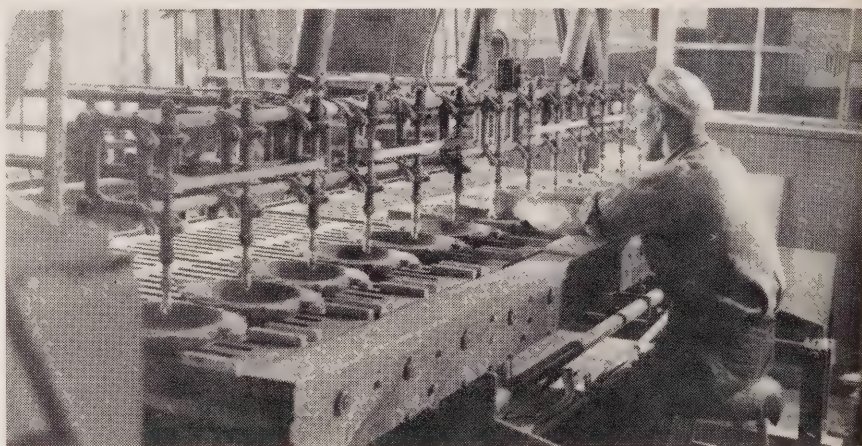
### Power Customers

In Napanee, as in every other Ontario town, the development of the community has been closely related to the supply of electricity. When electrical services were inaugurated in the town, they were confined to street lighting installations. Today the local commission's domestic customers alone number 1,250 and commercial customers total 260. Power customers, too, have steadily increased in number over the years. The local commission's first customer in this category was the Napanee *Post-Express*, one of the town's two weekly newspapers, where, in 1912, a 5-horsepower motor was installed to run the presses. From this modest beginning, the roster of power customers has grown until it numbers 29 at present. Among the commission's industrial customers are the Acme Farmers' Dairy, a Nabisco Foods plant producing animal foods, and the Napanee Creamery. Electric power supplied by the local commission is also an important aspect of the operations at the Napanee Iron Works, whose recently-developed, "package-type" automatic heating units are known all over Canada. Besides being one of the largest power customers, this concern is one of the town's most important industries, providing employment for about 75 people.

The commission's largest single power customer is The Gibbard Furniture Shops Ltd., the town's oldest established industry. Founded in 1835, this concern is Canada's oldest manufacturer of home furniture. And the tradition of fine craftsmanship, begun 120 years ago, has been continued to the present day, as a tour through the company's well-stocked showrooms in-



△  
SUBSTANTIAL increases in the town's population in recent years has necessitated the building of three new schools, including the modern Napanee and District Collegiate Institute.



△  
THIS multiple carver, which produces 13 identical patterns simultaneously, is one of several electrically-operated machines in the Gibbard furniture plant, which was founded in 1835.

dicates. Here, the visitor is impressed not only with the high standard of workmanship, but also with the wide range of designs, traditional and contemporary, featured by the company.

John Gibbard, the founder of the company, chose a site near the head of the falls on the Napanee River for his factory and for many years the enterprise, which still bears his name, continued to develop power from the power canal, which also served the other industries of the town. Since 1912, however, the plant has relied exclusively on electricity to run its machinery. Only last year a modern, indoor installation was completed to replace the 11 out-

door transformers serving the factory.

The power supplied by the local commission finds an astonishing number of adaptations in the manufacture of furniture. Power saws, sanding equipment, air compressors, spray-finishing equipment, conveyor belts, carving machines and machines, which prepare stacks of veneer, are only a few of the ways in which the woodworkers' tasks—in former years laboriously executed by manual labor—are now facilitated by electricity. And everywhere throughout the plant the hum of electrical equipment combines with the skill of Gibbard craftsmen to create a product whose reputation



for fine quality is well-known from Newfoundland to western Canada.

Apart from its manufacturing concerns, Napanee is still vitally interested in agriculture, even though it has ceased to be an important grain market. Surrounded as it is by rich agricultural land, the town has become an important retail centre serving a prosperous rural hinterland, which specializes in cattle raising, and dairy products in addition to mixed farming. And in these modern farming operations, electricity is no less important than it is in the town itself.

Indicative of the region's interest in agriculture are the fine fair grounds, located on the outskirts of town, where, amidst splendid oaks turned to gold by autumn's frost, the annual fall fair is held to display the produce of local farms. Formerly the Napanee Driving Park, these premises are now run by the Lennox Agricultural Society, an association of young and progressive farmers, who seek constant improvement of farming methods and the betterment of life on the farm. With electricity playing a vital part in the achievement of these objectives, it is appropriate that "Charlie" Walters, whose career has been so closely linked with the development of electrical services in this part of the province, should be an Honorary Director of this important organization.

### Salary Contributions

Adjacent to the fair grounds is located Napanee's impressive new memorial community centre, which houses an auditorium in the upper section, and a regulation-size ice surface, with accommodation for 1,800 spectators on the lower level. Such facilities would be a source of pride to any Ontario community, but how many could boast of Napanee's achievement in having this building entirely paid for before its doors were officially opened? This singular achievement was made possible by the wholehearted co-operation of every member of the

community. To raise the necessary \$135,000, the women of the town ran a "white elephant" shop, and voluntary payroll deductions were made all over town. Linemen of the local P.U.C. staff, for example, each pledged \$1.00 per week for a year. At the end of that period, they renewed their pledge until the objective was reached just 18 months after the campaign began.

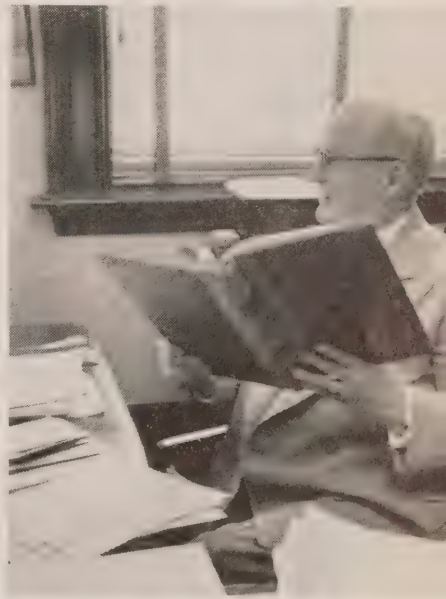
Educational and housing facilities, too, have been developing at a remarkable rate to meet the needs of this expanding community. In the past few years, two new public schools and a new Napanee and District Collegiate have been built. Likewise, many attractive modern homes are rapidly making their appearance, extending the limits of the town farther and farther into the surrounding countryside. Like most other Ontario towns, Napanee is welcoming an ever-increasing number of new residents, many of whom live in Napanee and commute to work in factories as far away as Kingston.

The steady increase in population has been reflected in the growing number of Hydro customers served by the local public utilities commission. Between 1945 and 1955, the number of domestic customers increased from 920 to 1,250 — all of which has kept Mr. Walters, his staff and the commission's five utility trucks very busy.

*(Continued on page 29)*



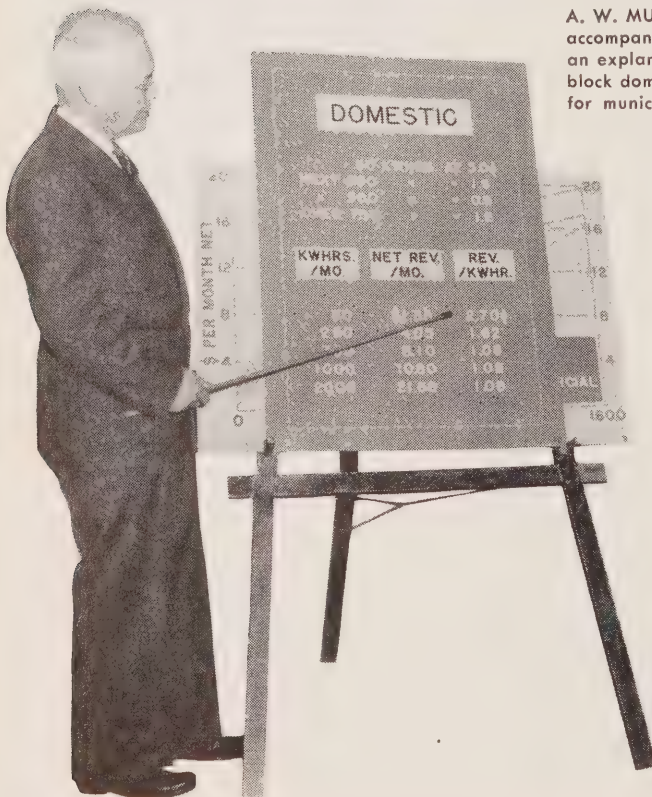
△ ASSOCIATED with Napanee P.U.C. since it was formed in 1930, George Reid, assistant to the manager (right) and Line Superintendent Ed. Loucks look over plans showing the earliest installations of electrical services.



△ MARKING his 50th year as Manager of Napanee's electrical system, Charles Walters (above) looks through the town council minute book, which records the decision to build a municipally-owned steam generating plant a half-century ago. Mr. and Mrs. Walters (left), who are also celebrating their golden wedding anniversary this year, strike up the band and some memories of the days when "The Charlie Walters' Dance Band" was a familiar part of the town's social life.

AN EXPLANATION OF THE NEW

# Municipal Resale Rate Structures



A. W. MURDOCK, author of the accompanying article, during an explanation of the new four-block domestic rate structure for municipal systems.

THE present rate structures used in the municipalities for billing domestic, commercial and power customers have been in effect for many years; in fact it could be said with reasonable accuracy, since the early days of Hydro. The rates themselves have been changed from time to time, to meet varying revenue requirements, but the structures, which constitute the basic form of the rate, have remained unaltered down through the years. It is only natural that some doubt should arise as to whether the structures, which may have been quite suitable 30 years ago, are adequately meeting present day conditions. Consequently, it was decided that a review of the entire rates situation should be undertaken in conjunction with the A.M.E.U. Rates Committee. The studies extended over a period of nearly three years and disclosed several rather serious weaknesses in the structures and many inequalities in charges amongst customers. Some of the major weaknesses are outlined herein, together with the changes which have been introduced to correct them.

## Critical Peak Period

The Commission's annual peak for the Southern Ontario System occurs in December at approximately 5.30 p.m. The time of the monthly system peak remains practically unchanged from October to March inclusive, and shifts to approximately 11.30 a.m. in the other six months. In the municipalities the pattern, although not quite so clearly defined, follows very closely that of the system. Approximately 70 per cent of the municipalities' total operating costs is incurred in power purchased from the Commission, so that any situation, which affects a municipality's peak, or the system peak is of vital importance. The exact time of the peaks is not particularly

\*(Mr. Murdock is Ontario Hydro's Rate Study Engineer.)



important. The significant feature is the fact that they occur between 8.30 a.m. and 6.00 p.m., Monday through Friday, except in the case of some of the smaller municipalities with little or no power load. This critical load period is equivalent to a maximum of approximately 200 hours per month.

### Industrial Power

The present power structure consists of a service charge of \$1.00, \$1.20 or \$1.35 per kw., plus two blocks of 50 hours' use and end rates of .25c, .30c or .33c per kwhr. Over 65 per cent of the power kwhrs. are billed at the third rate and, as this becomes effective after 100 hours' use, it means that a large number of kwhrs. now billed at the low rate are used during the critical load period and hence may affect the municipal or system peak. In order to correct this situation, another 100-hour block has been introduced. This provides definite assurance that the kwhrs., to which the low end rate will apply, can be used only during off-peak hours. The 50-hour blocks, representing as they do only 7 per cent monthly load factor, seem superfluous, and have been combined into a 100-hour block. The varying three service charges have been replaced by a uniform service charge of \$1.00, and the end rate established at .33c. Thus the new structure consists of a service charge of \$1.00 per kw per month, followed by two, 100-hour blocks and an end rate of .33c.

### Commercial

Somewhat similar conditions prevail in the commercial rate structure. This consists at present of a service charge of 50c per kw. per month followed by a single, 100-hour block and this, in turn, by an end rate. There is a wide variation in the end rate in different municipalities, and in every case it is a great deal higher than the end power rate. The resultant unjustifiable disparity in cost between high load factor commercial and power customers has been modified substantially by introducing

a second, 100-hour block. This has an added advantage in that it permits reasonable and desirable coordination between the commercial and power structures.

At the other end of the scale, we have the small commercial customer billed on the basis of connected load. This necessitates constant checking, and aside from customer annoyance and extra expense it is an unfair method of establishing his billing demand. The cost to the small commercial customer is approximately double the domestic customer's cost for the same consumption. Admittedly, the peak responsibility of these customers as a group is higher than that of the domestic customers, but the large difference in customer bills cannot be justified. The overall conditions surrounding service to the small commercial customers are more akin to those of the domestic customers than to those of the large commercial customers with whom they are now classified. In order to correct this disparity, provisions have been made, in any municipality where revenue requirements permit, that commercial customers with connected loads up to 5 kw. will be billed at domestic rates.

### Domestic

The present structure consists of two blocks with 60 kwhrs. at a first rate and the balance at a second rate. Nearly 80 per cent of the kwhrs. are sold at the second rate and this percentage is steadily increasing. In order to meet cost and revenue conditions in individual municipalities, within the narrow limitations of a two-block structure, it has been necessary, down through the years, to increase or decrease either the first or second rate by one or more mills. With the various combinations which have developed, there are now over 200 different domestic rates in force. The domestic loads have increased to such an extent and vary over such wide limits that a two-block structure is no longer adequate, and the new structure contains four blocks. The

rates in the first three blocks are descending and the customer cost per kwhr. becomes less until, at 750 kwhrs. per month it reaches the lowest possible value, consistent with the cost situation in the municipality. At that point the fourth rate becomes effective. It is higher than the third rate, but bears such a relationship that the cost per kwhr., irrespective of further consumption, remains practically the same as at 750 kwhrs. Thus a customer is protected against an increase in his cost per kwhr. and the utility against a decrease in revenue per kwhr. as the consumption increases beyond 750 kwhrs. The structure is also very flexible, and, if at some future date, the cost responsibility shifts farther toward the large customers, either because of their higher demands or the impact of steam generation, the situation can be met by shortening the third block or increasing the end rate without affecting the other customers. In the new schedule the number of rates has been reduced to 25, and this is sufficient to meet all revenue requirements except in the case of a very few high-cost municipalities.

The principles involved in the three structures are not new in the electrical utility field. The structures incorporate some of the more desirable features in use elsewhere, and eliminate others, which experience has shown to be undesirable. They are being introduced in individual municipalities as changes in existing rates are required, and with the full concurrence of the municipality. It is felt that the new structures fulfill present-day requirements in a much more realistic manner than the present structures, which urgently required revision to meet changing supply conditions. ■

# PATHWAYS TO

## CHAPTER VI—BRINGING POWER TO

### PART 1 - TRANSMISSION LINES

By J. E. Sproule\*

**T**RANSMISSION lines carry power from the generating stations via one or more transformer stations to the distribution centres.

For many practical and economical reasons, power is generated at low voltage — rarely greater than 13,200 volts — and transformed to higher voltage by station step up equipment for transmission to the areas where it is to be utilized.

\*(Mr. Sproule is Consulting Transmission Engineer, Ontario Hydro.)

Transmission at 230 kilovolts (230,000 volts) is used where large blocks of power have to be transmitted over considerable distances. Where distances are shorter and loads lighter, lower voltages are used, such as 115 kv, 44 kv and 26 kv.

Long and heavy high voltage transmission lines, for economical and engineering reasons, are usually carried on steel towers. Wood pole lines have an initial lower cost and are customarily used for lower voltage and lighter lines.

**Choosing The Route** — To select the most suitable route for a trans-

mission line, it is first necessary to study the terrain over which the line must pass. The shortest route cannot always be followed, since many natural and man-made obstacles must be avoided.

**Aerial Photographs** — When the preliminary route has been chosen, aerial photographs are frequently used for further study. When as much information as possible has been gathered and analysed and the route definitely decided upon, a survey party is then sent to the field to locate the centre line. The actual positioning of the structures is done at a later date.

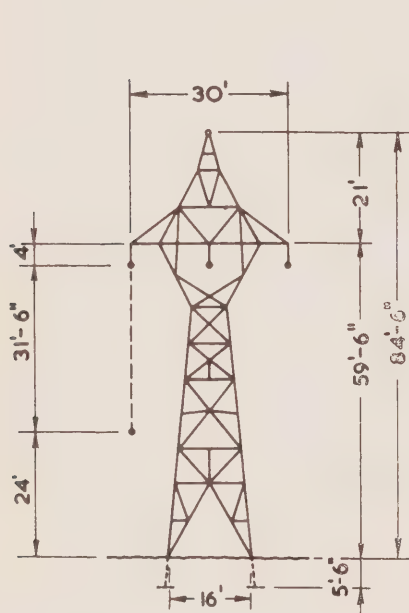


FIGURE 1 — Power conductors — 3; ground cables — 1; standard span 1,000 feet for 477,000 circular mil; aluminum conductor steel-reinforced; weight of standard suspension structure 4,905 lbs.; 115-kv. 1939 type single-circuit suspension tower.

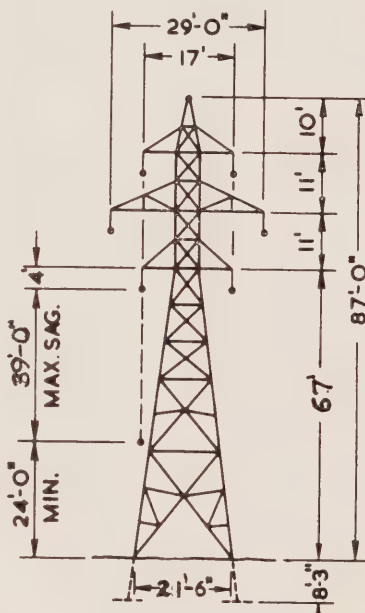


FIGURE 2 — Power conductors — 6; ground cables — 1; standard span 1,000 feet for 605,000 circular mil; aluminum conductor steel-reinforced; weight of standard suspension structure 13,216 lbs.; 115-kv. 1945 type double-circuit suspension tower.

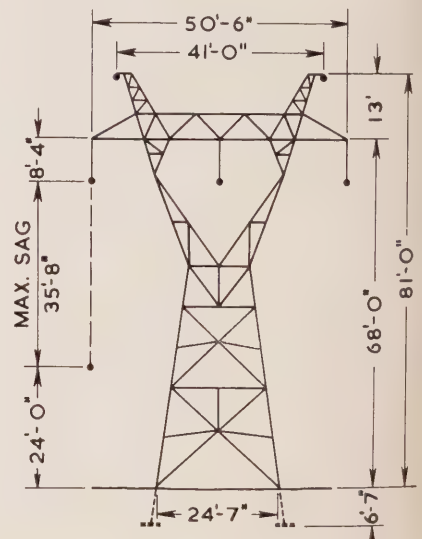


FIGURE 3 — Power conductors — 3; ground cables — 2; standard span 1,100 feet for 795,000 circular mil; aluminum conductor steel reinforced; weight of standard suspension structure 12,819 lbs.; 230-kv. 1946 type single-circuit suspension tower.



# POWER

## THE CUSTOMER

**Location Survey** — When a survey line is run through country where roads or railways do not exist, then other means of transportation for the location party must be adopted — such as aeroplane, canoe, or snowmobile. In undeveloped country, a trail must be blazed and tote roads built. In past years, dog teams have been used in some of the more remote districts in winter-time, but nowadays mechanized transport for supplies and equipment is generally available.

**Route plans** — generally at a scale of 200 feet = 1" are compiled at Head Office, showing ground de-

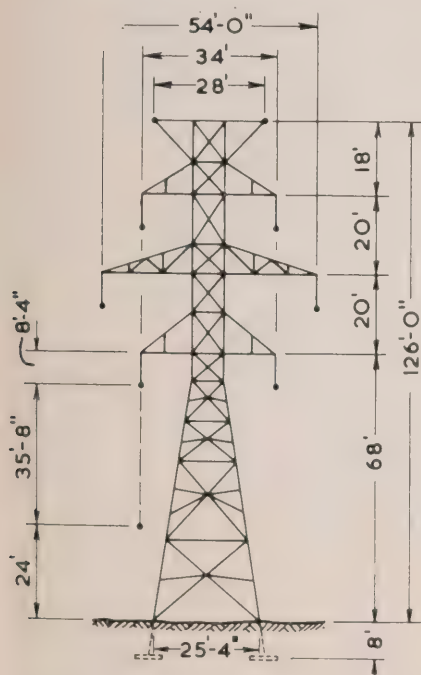


FIGURE 4 — Power conductors — 6; ground cables — 2; standard span 1,100 feet for 795,000 circular mil; aluminum conductor steel reinforced; weight of standard suspension structure 24,436 lbs.; 230-kv. 1949 type double-circuit suspension tower.

tail along the proposed transmission line as recorded by the surveyor. They also show lot, concession, and owners' name of the properties traversed.

Profiles of the centre line are plotted for the high voltage lines, and occasionally for the low voltage lines when they traverse particularly rough country. They provide an accurate record of the elevations of the ground along the centre line of the proposed transmission line and any side hills that may affect the location of the line. The heights of any other power lines, telephone, or telegraph wires (as well as railways, highways, roads, etc.), are shown at the point of crossing so that the power conductors passing over or under these obstacles will have sufficient electrical clearances to safeguard the public. Profiles are also used for the economical spotting of tower or pole structures.

### Steel Tower Lines

The voltage at which it is decided to transmit power influences the design of the steel towers. At 230,-

000 volts, the phase-to-phase spacing and the distance from any conductor to the nearest steel is greater than at 115,000 volts. The effects of sleet, heavy winds and high and low temperatures on the conductors are some of the mechanical forces that must be considered along with the electrical requirements in determining the spacing required.

Figures 1, 2, 3 and 4 illustrate modern types of steel towers and the conductor positions and spacings for 115 kv and 230 kv lines. It will be seen that the conductor height above ground at the lowest crossarm is much the same regardless of voltage. There are differences in the outline of the towers for different voltages and some of these differences are explained later.

**Conductors** — For the transmission and distribution of power, an overhead conductor must be a good conductor of electricity, strong enough to withstand heavy tensions and reasonably low in cost. Steel

*(Continued on page 22)*



reinforced aluminum conductors, known as A.C.S.R., meet these requirements and are commonly used in transmission lines.

The centre core of steel wires provides the strength while the outer layers of aluminum provide the current-carrying capacity. (Figure 5 — below.)

The amount of power to be transmitted over the line at the voltage selected, together with acceptable line losses are major factors in determining the size of the conductor. These requirements, with others, are considered by the Planning Division in determining the conductor size. Having determined the conductor and the type of structure to be used, that is, wood or steel, single or double circuit, the



FIGURE 5

economical average spacing of the structures for the different types has, from experience and study over the years, been worked out. For a 230-kv line with 795,000 CM A.C.S.R. conductors, an average span length of 1,100 feet seems to fit all conditions. A tower height to the bottom arm of approximately 68 feet is indicated. This is made up of ground clearance 24 feet, conductor sag 36 feet, insulators and clamp length 8 feet.

In order to prevent the conductor from arcing to the tower steel, sufficient clearance must be allowed to take care of the swing of the conductor under severe wind conditions, plus the striking distance of an arc which may be caused by switching or other surges on the transmission line. This feature will affect the phase-to-phase spacing as well as influencing the design of the tower.

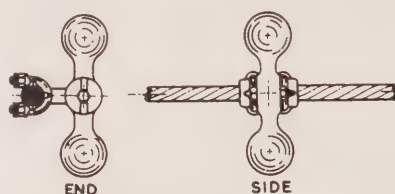
In double-circuit towers, the mid-

dle arm is generally longer than the top and bottom arms to allow for galloping conductors or for the unloading of ice from one conductor while the others are still ice covered.

**Vibrations** — The recognition and use of aeolian vibrations dates back to the Greeks who colonized Asia Minor. They discovered that, by stretching wires of different sizes and lengths on a wooden frame between pegs at various tensions, they could tune them so that when exposed to the wind, they would produce harmonic sounds and overtones. The most common manifestation of aeolian vibrations today is the "singing" of telegraph or telephone wires under light winds.

Aeolian vibration is serious in stranded cables on long spans at heavy tensions. Individual strands of wire at the entrance to supporting clamps fail under this type of vibration. To offset this, a reinforcement of the conductor at the entrance to the clamp, or a device to dampen the vibrations, has proved successful.

Figure 6 shows a torsional vibration damper, a development of Hydro engineers, which is successful



TORSIONAL-TYPE ABSORBER

FIGURE 6

in protecting the most important part of the transmission line — the conducting cables.

"Galloping" is another severe type of vibration. Galloping conductors do not dance in unison, and, therefore, conductor spacing must allow considerable freedom of movement of conductors to safeguard against interruptions.

**Conductor Sag** — The sag in the conductor determines the tension or

vice versa. It is a generally accepted practice that the 60°F. tension in the conductor should not be greater than 11 per cent of the ultimate strength for fatigue reasons. If it is necessary to stress the conductor more than this, added protection, such as vibration dampers, must be given to the conductors. Ground clearance is determined from the sag of the conductor at 120°F. Where special conditions are encountered, such as road or railway crossings or other ground fixtures, special clearances are required.

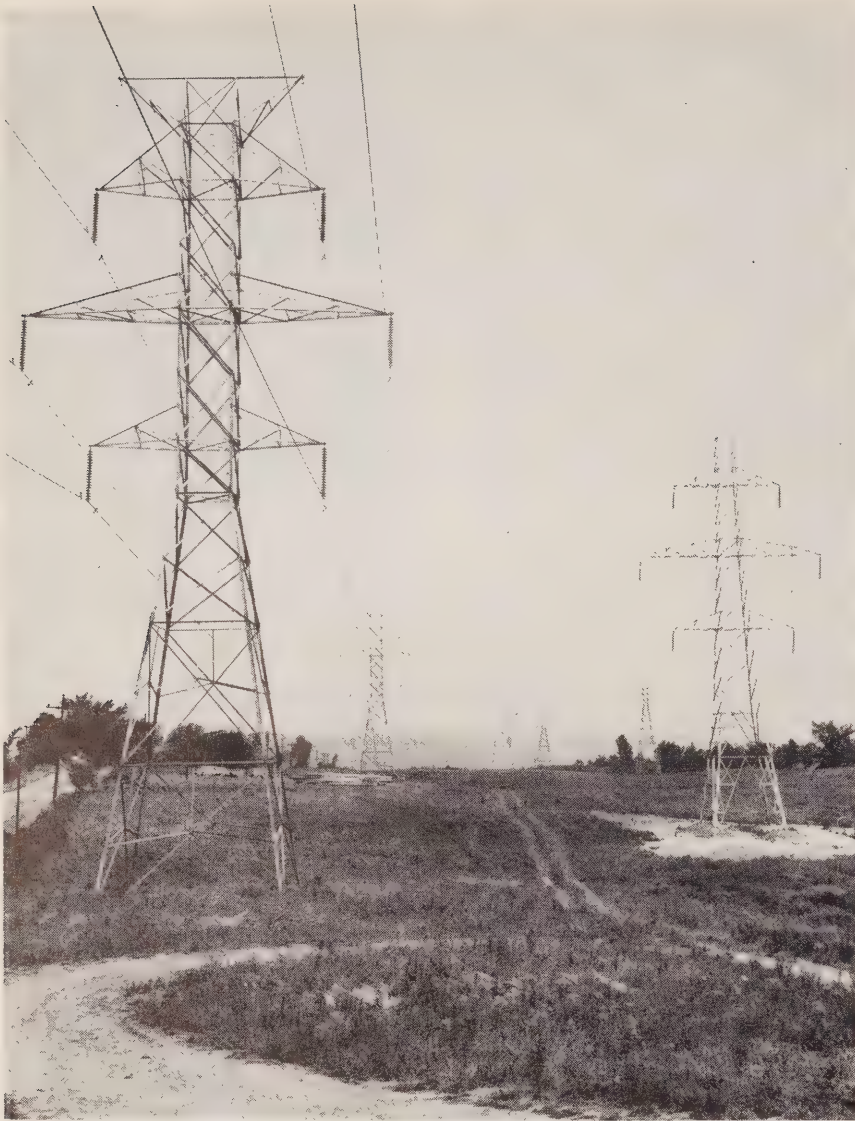
**Footings** — Insofar as possible, transmission routes from the generating station to the power or consuming areas are chosen to avoid quicksand, swamp, muskeg, fill dumps, bottomless soils, low-bearing moisture-saturated clays and other adverse ground conditions; but all these different types of soils have to be dealt with at one time or another and tower footings have to be designed to meet conditions. In the design of tower footings, the uplift generally determines the size and depth of the grillage or concrete pads except in unusual cases where the bearing quality of the soil is insufficient to support the structure and its designed loads.

The type of footing required to support the towers on the 4-circuit, 115,000-volt transmission line in Toronto extending from the Richard L. Hearn Generating Station to Don Fleet Junction on the Don Roadway, just south of Eastern Avenue, involved the use of massive, reinforced concrete on heavy steel piles. The heaviest of these footings rests on sixteen, 12-inch steel H-sections weighing 24 tons driven 48 feet below the surface. The reinforced concrete surrounding them weighs 208 tons.

Another massive type of spread footing consisting of a steel stub angle of the tower encased in a large reinforced concrete pier resting on a concrete pad, was provided for a terminal tower of the E. V. Buchanan Transformer Station near London, where the bearing capa-







△  
THREE TYPES of Ontario Hydro transmission towers are shown in this photograph. Both types in the foreground are 230,000-volt, double-circuit towers carrying 60-cycle lines from the Sir Adam Beck-Niagara Generating Station No. 2. Tower on the left is of Canadian manufacture, while the tower on the right is a British design. In the right background is a 115,000-volt tower carrying 25-cycle lines from the older generating stations in the Niagara area.

Lengths vary from 20 to 75 feet. Strength depends on the species of wood and the diameter. All poles are given preservative treatment, which extends the average life to approximately 30 years.

**Switches** — In order to sectionalize or open a line, switches of the air-break type are located at various points — usually at line junctions. They are group-operated manually or by motor — all three

phases opening simultaneously. Air-break switches for use on lines of 44,000 volts or under are usually mounted on a single or two-pole structure. Under load conditions, the power is usually first interrupted by circuit-breakers located at the station before the switches are operated.

Air-break switches play an important part in maintaining reliable service to customers throughout the province.

On low voltage wood pole lines where the tensions are not in excess of 3,000 lbs., the conductor is attached to porcelain pin type insulators supported on wooden crossarms.

On steel tower lines and 115,000-volt wood pole lines, the conductor is suspended from the crossarms of the structure by a string of insulators. This type of insulator was developed by Ontario Hydro in conjunction with the manufacturers of porcelain insulators and was first used by the Commission in 1910. On wood pole lines, where possible, wood is placed in series with the porcelain insulation to add to the flashover value of the structure.

**Clamps** — On high voltage lines, the suspension clamps, which are usually forged iron or cast aluminum, must be so designed that they do not appreciably kink or bend the conductor in supporting it; and they must not act as choke coils, which would cause excessive heating. Today's suspension clamps are aluminum for A.C.S.R. conductors as it was found that ferrous clamps caused heating and extra losses on the transmission lines. At steel tower terminations, when the conductor must be dead-ended at the tower, compression dead-ends are used.

**Joints** — The Commission has given considerable of attention to methods of splicing or joining conductors where high strength and good conductivity are required. On lines with the smaller conductor, a twisted sleeve joint is used. For large conductors a compression joint is made. In this type of joint, the conductor ends are butted at the mid point of a cylindrically-bored sleeve, which is then compressed from the middle towards the ends, in successive steps, by an hydraulic press, which creates a pressure sufficient to actually "flow" the cold metal.

The transposition of phase wires, which means rotating their relative



positions one to another — left, middle and right alternately — is often considered necessary to equalize the capacity between each phase and ground and also the capacity between phases. Moreover, it cuts down the electrical interference with communication lines and improves the stability of the power line. This change in position is conveniently made at a tower.

### Protection

Lightning is one of the major factors that must be considered in the design of transmission lines. The installation of ground cables at the top of the structure is a method used to protect the conductors from direct or indirect lightning strokes. In order to quickly drain off the high voltage caused by the lightning strokes, a low resistance path to ground must be provided. In the southern part of the province fair grounding conditions usually obtain, but in the central and northern sections gravel, sand, as well as rock ridges, with little or no overburden, occur extensively, presenting a high electrical resistance.

During the erection of a line, ground resistance measurements are made at the structure location. Where this is over 20 ohms, remedial steps are taken. These consist of laying in the ground a wire connection from the structure to a low resistance area. Ground rods are driven in this area and the ground wire is connected to them. Where a low resistance area is not in the immediate vicinity, rods are driven until a sufficiently low resistance is obtained. Sometimes this depth may be 150 feet. Other means of dealing with this situation are by burying a continuous wire, known as a counterpoise, along the right-of-way, generally under and paralleling the outside conductor of the transmission line. By these means, the conducting path is completed from the ground cables strung at the top of the structure to a low resistance area.



AN ANGLE TOWER on Commissioner St., Toronto, supports this four-circuit, 115,000-volt line between the Richard L. Hearn Generating Station and Don-Fleet Junction. Footings for these towers involved the use of massive, reinforced concrete on steel piles.

IN SOME CASES, twin-pole, "H-frame" structures are used for 115,000-volt lines. This permits cross-bracing (as indicated in this photograph) as an alternative to storm sideguying to enable the poles to withstand high wind velocities and heavy ice loads.



Power line inspectors are present during the construction of the transmission line and also make a final inspection when the line is completed. The phasing is checked by linascope to ensure that there is a proper correlation between the rotation at the generating station and the terminals at the receiving station. The line is then ready for service.



# TECHNICAL TALKS

*lively discussion  
periods feature  
8th A.M.E.U.  
summer conference*

“**Y**ou owe it to your jobs to attend this meeting . . . our participation in a technical conference such as this results in better utility operation in each Hydro municipality.” With these words A.M.E.U. President E. A. Washburn, stressed the importance of the 8th Summer Technical Conference, held June 21-23 this year. While opinions diverged on some of the technical points brought out during the course of the heavy, three-day business agenda, delegates were unanimous in declaring the conference at Bigwin Inn, Muskoka, the best to date in every respect.

An all-time attendance record of 333 was established this year, but the success of the meeting was not judged by registration alone. Its real worth, delegates agreed, was to be found in the high attendance at all sessions, early and late; in the long and spirited question-and-answer periods following each paper, and in the willingness of the A.M.E.U. members to participate personally by serving on committees and sub-committees as the need arose.

Discussions at the four technical sessions covered many subjects of vital interest to the efficient opera-

tion of the municipal electrical system. The first paper “Some Observations on Going from 4 kv. to 12 kv. Distribution” by D. K. Blake, General Electric Company, Schenectady, N.Y., evoked so much interest that discussion was carried over into the next session. The subject was taken up later by Harry Hyde, Assistant Chief Engineer, Toronto Hydro, reporting on behalf of the sub-committee on System Planning.

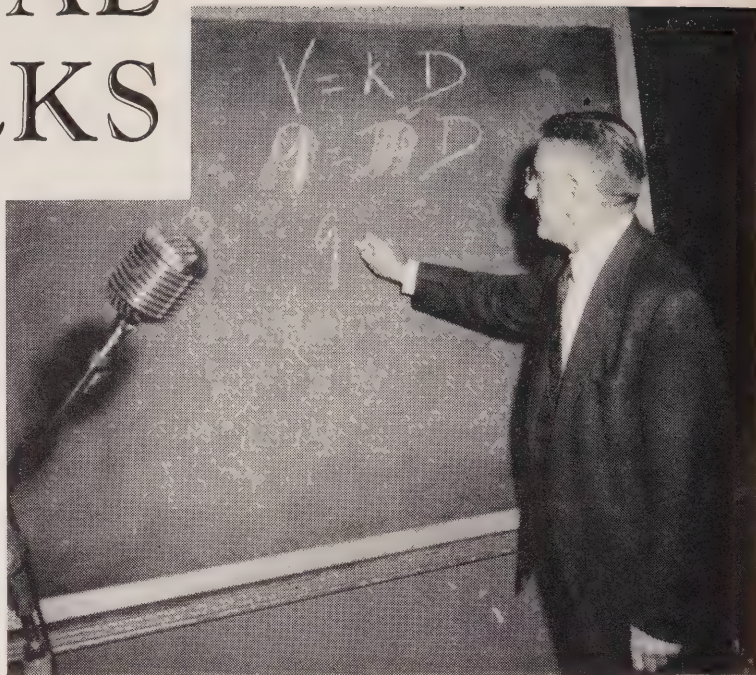
Mr. Blake first discussed the economies and drawbacks involved in going from a lower to a higher voltage at the customer utilization level. Doubling the voltage at this stage, the speaker pointed out, would appear to effect substantial economies. In practice, however, studies indicated that the net savings to the customer would be marginal—from 3 to 5 per cent. The speaker expressed doubt that any utility manager would approach his customers with such a proposition, particularly in view of the disputed

extra risk involved in the use of higher voltages.

Any estimated savings, Mr. Blake explained, still did not take into consideration the costs involved in supplying appliances for the higher voltages. That the costs would be substantial was indicated by surveys conducted in the United States. They showed that customers spend about five times as much each year for 115-volt appliances as the entire U.S. public and private power utilities spend for all their distribution systems — whether overhead or underground and including industrial, commercial, domestic and rural facilities. This implied that actual savings might be non-existent. The speaker stressed that studies were continuing, but voiced the conviction that the changeover would not be economical.

## Future Load Requirements

Mr. Blake next considered the important question of future load requirements and the possibility

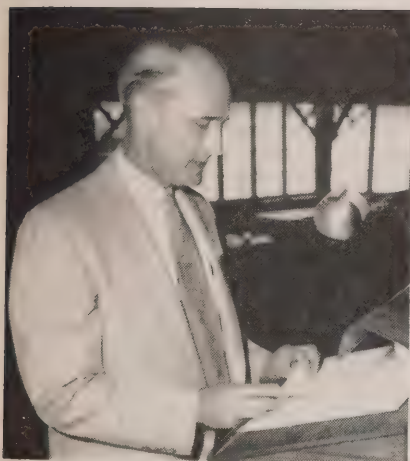


△ D. K. BLAKE, Schenectady, N.Y., created interest with his discussion of higher voltages for distribution systems.





THIS PANEL GROUP, left to right, Ronald Harrison, Scarborough Township; E. J. Woelfle, Toronto; R. W. Brown, Etobicoke Township, R. H. Starr, Toronto Township, and A. "Scotty" Hamilton, Forest Hill Village, Chairman, discussed "Shopping Centre Loads."



J. G. SUTHERLAND, Hamilton, Chairman, Underground Construction Sub-committee, introduced the section dealing with this subject, which is to be incorporated in the "Guide to Municipal Standard Construction."

IN ADDITION to his duties as Chairman of the Program Committee for this year's conference, Ray Pfaff, St. Catharines, presented a paper on "Aluminum vs. Copper Conductors for Overhead Distribution Systems."



WITH a wide background of experience, W. Wylie, Toronto Hydro, brought his audience up to date on "Metering for Apartments."



that they would make it necessary to abandon the use of 4 kv. primary feeders. He pointed out the advantages and disadvantages of the 12 kv. system and concluded that 4 kv., as far as its electrical adequacy in terms of good voltage was concerned, would carry any load experienced in the future. The important consideration, according to the speaker, was the ability of the individual utility to find room for the number of substations and circuits necessary to carry the loads of the future. If such accommodation could not be found, higher voltages would be necessary, regardless of the economies involved. The extra cost for accommodation at very high densities might make 12-kv. distribution more economical. He urged management to determine future load requirements now, and to take immediate action, if congestion were indicated, in order to keep conversion costs to a minimum.

Mr. Hyde, reporting for the sub-committee on System Planning, of which he is Chairman, followed up this theme. He said that his group was now organized to investigate such problems as higher utilization voltage as Mr. Blake had suggested. He, too, stressed the importance of pre-determining load requirements as miscalculations in this direction could result in the loss of millions of dollars. Initial investigations by the sub-committee on load growth indicated that a very accurate estimate could be compiled with the use of sampling methods, such as are employed by business corporations in market research.

Mr. Hyde estimated that a cross-sectional survey of 1,000 representative electrical customers may require a capital expenditure of over \$100,000 for metering equipment. In addition there would be an annual operating cost to the municipalities where surveys are being conducted for the installation of meters, forwarding the data gathered, etc. He expressed the view that this was a

*(Continued on page 28)*



THESE DELEGATES, left to right, C. B. Campbell, Trenton; Neil H. McKinnon, Sudbury; W. M. Hogan and R. G. Lewis, Lindsay, were noted studying samples of spun aerial cable after the presentation of an interesting paper on that subject by J. A. Williamson, Niagara Falls.

small price to pay for the long-term savings in capital expenditure likely to result.

#### A.M.E.U. Reorganization

Recent changes in the A.M.E.U. organization were explained to the delegates by President Washburn. "This year," he said, "we have a new look. We have reorganized for a more efficient and intelligent approach to our problems, and to shift the weight of responsibility to more shoulders." He pointed out that the Executive Committee is now composed of 21 men, 15 being elected by ballot. The others are appointed constitutionally by the president to fill key positions in the organization, their appointments being ratified by the elected members of the Executive Committee.

Mr. Washburn also revealed some interesting statistics, reflecting the high degree of active participation of members in A.M.E.U. activities. "There are 269 men working for the A.M.E.U. this year," he reported, "not including regional committees and the district metermen's associations, which are part and parcel of this organization. When these are included a figure of over 300 persons serving on committees can be established."

Indicative of Ontario Hydro's desire to co-operate in every way possible with the A.M.E.U. was the presence at the conference of Hon. W. K. Warrender, and W. Ross

Strike, Hydro Vice-Chairmen, and Commissioner A. A. Kennedy.

#### Underground Construction Guide

The report of the sub-committee on Underground Construction was presented by its Chairman, Gordon Sutherland, Hamilton. He distributed copies of the "Guide for Underground Design and Construction" and explained that during the year this sub-committee had reviewed the whole text, making several revisions and additions. When finally completed it will be added as a section to the "Guide to Municipal Standard Construction," which also contains sections on Overhead Construction and Distribution Design and Stations. Mr. Sutherland stressed the point that the new section was not intended as an absolute standard, but as a guide for municipalities that are planning underground installations.

The paper, "Shopping Centre Loads," presented by A. "Scotty" Hamilton, Forest Hill, provided the basis for an informative discussion period under the guidance of a panel consisting of: Ronald Harrison, Scarborough Township; E. J. Woelfle, Toronto; R. W. Brown, Etobicoke Township and R. H. Starr, Toronto Township. Members of the panel assisted by describing their own on-the-job experiences with shopping-centre installations. A unanimous motion was passed that

a committee be appointed to investigate the possibility of establishing standard, basic procedures for handling this type of service.

The Program Committee, with Ray Pfaff as Chairman, received a hearty vote of thanks for the calibre of the technical data presented. Lively discussion periods followed the presentation of other papers, including: "Metering for Apartments" by W. J. Wylie, Toronto; "Hanging Transformers and Three Phase Distribution Transformers" by G. F. Janaway, St. Catharines; "Insulated Aerial Cable" by J. A. Williamson, Niagara Falls, and "Aluminum Versus Copper Cable" by Ray Pfaff, St. Catharines. The activities of the Engineering Section Committee were reviewed by its Chairman, J. A. Williamson.

#### O.M.E.A. Greetings

In bringing greetings from the O.M.E.A., President Gordon Fuller, stated that Hydro was judged largely by the quality of local service it was able to provide.

"It is your privilege," he said, "and your responsibility, jointly with those who constitute the O.M.E.A., to see that every municipality represented here today is well served by its Hydro system." He outlined the many instances where the O.M.E.A. had safeguarded the rights of the Hydro municipalities and he emphasized the democratic nature of its operations.

Plans for next year's Technical Conference, which will be held in Ottawa early in June, provided suitable accommodation is available, were announced. Alternate arrangements call for a return to Bigwin Inn. In revealing these plans, President Washburn said he was prepared to recommend to the 1957 Program Committee that consideration be given to enlarging the scope of the agenda. In this case it would be necessary to hold some of the sessions concurrently, leaving the delegates free to select only those sessions of greatest individual interest.

—by Don. Wright.



## BECK—THE MAN

*(Continued from page 8)*

Hospital in Baltimore for an examination. When he came home, he said "I am finished." He said that during the examination he had overheard the doctors in the next room discussing his case and had heard the words "pernicious anaemia." He called them in and demanded to know everything, saying "I can take it."

Although confined to his home in London he made several trips to his beloved Sanatorium. On the last visit there standing with one or two directors and officials he said to us, "There is so much to do, and I am all in, I need your help. You fellows must see things through."

I saw him last in his bed about two weeks before he died. He said, "I wonder what will be thought of me when I'm gone. The London and Port Stanley Railway is a failure; I fear for Hydro at the hands of the politicians; but I have one hope that people will think well of me for my work at the Sanatorium."

Hydro overshadows all his other work, but, without doubt, smaller endeavors, such as the water supply of London and, above all, the Sanatorium were a source of great pride to him.

We may wonder if, in his greatest dreams, he ever envisioned the vast successful Hydro of today, including the St. Lawrence development, for which he fought long and hard. ■

## NAPANEE:

*(Continued from page 17)*

In addition to serving as Manager of the Public Utilities Commission of the Town of Napanee, Mr. Walters manages the Napanee Rural Operating Area for Ontario Hydro. Spelling out a very full work schedule, this "double life" gives him the distinction of being one of the few men in the province to serve in both capacities. And if it were possible to single out one aspect of this

Hydro veteran's career in which his contribution has been most outstanding, it would be his role in the extension of Hydro services into the rural area surrounding his native town.

### Rural Electrification

Prior to 1927, there were no electrical services in the rural regions near Napanee. However, in that year, a beginning was made towards rural electrification with the construction of three-quarters of a mile of line to serve one customer. During the next two years, other small extensions were carried out and when the local commission took over from Ontario Hydro in 1930, about 10 miles of rural lines had been built. Realizing the possibilities of rural expansion, Mr. Walters, in the first year in which the local commission operated the Hydro system, secured contracts covering almost 49 miles of rural extension. At that time, this was the largest single block of contracts ever brought in at one time. And to everyone's amazement, the energetic manager repeated this feat the following year. From that time until the present, the extension of Hydro services into the farming areas has progressed at a very satisfactory rate until today there are over 500 miles of line serving rural customers as well as the villages of Newburgh and Bath. When the town took over from Ontario Hydro in 1930, there were fewer than 15 rural customers in the Napanee district. Today, Hydro services are an indispensable asset to 1,864 farm, 1,162 hamlet and 11 power customers as well as 401 commercial establishments and 272 summer homes. All this has been achieved in just over 25 years, and it can be traced directly to the efforts of Mr. Walters, who has supervised and planned the whole program, and who, because of the important part he has played in the development of the region's electrical services, can claim to be on speaking terms with every Hydro pole and mile of

line, which carries the far-reaching benefits of electricity to rural customers.

Located on the outskirts of town, the Napanee substation serves both the town itself and the rural area. Standing by the humming rural transformer installations one bright day in April, "Charlie" Walters mused: "It has been a great pleasure to live through a period such as this when rural development has been so rapid." And indeed he has had the pleasure of watching the development, and guiding the course, of Hydro services in his native community. And for the fine achievements in both the rural and urban areas of operation, much of the credit belongs to the man whose career of public service began 50 years ago when he supervised the installation of the municipal steam generating plant. ■

## ACCENT ON ACCOUNTING

*(Continued from page 11)*

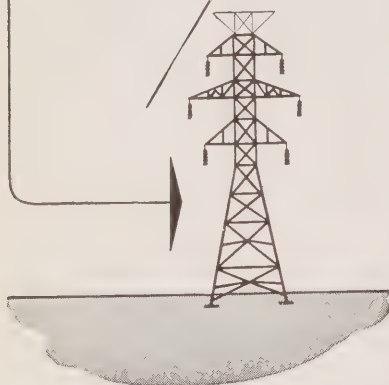
L. A. Vradenburg, Ottawa; J. W. Hammond, Chairman, Accounting and Office Administration Committee, A.M.E.U., Hamilton; E. A. Washburn, President, A.M.E.U., Stratford; W. R. Mathieson, Secretary-Treasurer, A.M.E.U., Toronto; Clare Campbell, District Director A.M.E.U., Trenton; J. H. Page, District Director, A.M.E.U., Renfrew; W. H. Gibbie, Ottawa.

Nomination of the following to organize the 1957 conference was unanimously approved: Chairman Floyd McRae; Secretary-Treasurer, John M. Campbell; Committee: James L. Cochrane, A. W. Hume, D. G. Harrington, J. C. Saunders, R. E. Ainsworth, Ross Stivers, E. J. Leonard.

A cordial invitation to the delegates was extended by Western Division Chairman David N. Durward, Galt, to attend the conference in Windsor on September 20-21, at which the principal speaker is to be Ontario Hydro's Chief Engineer, Dr. Otto Holden.

—by Frank C. Wood.

## ALONG HYDRO LINES



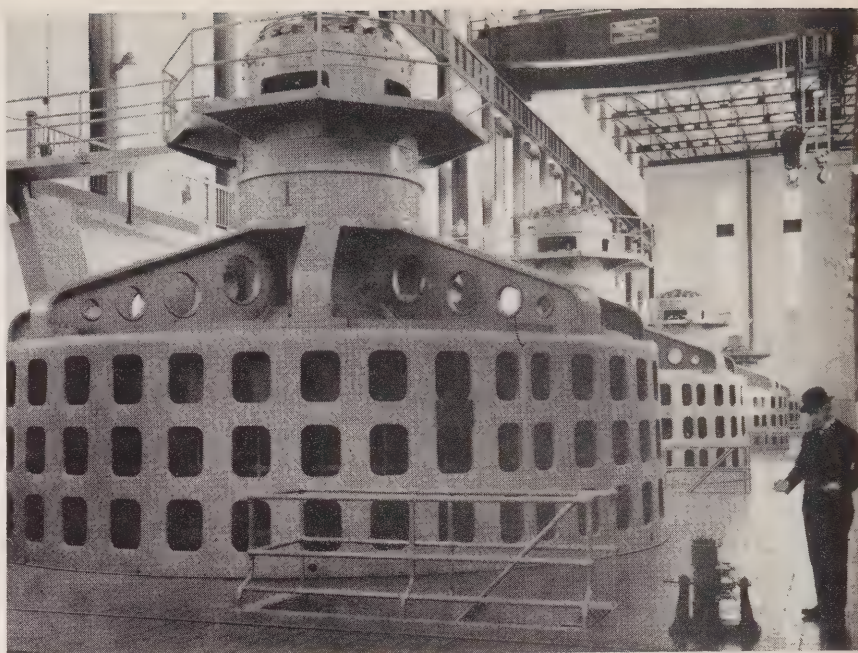
### Walkerton Names New Commissioner

A vacancy on the Walkerton Public Utilities Commission, created by the death of Harry T. Buehlow, has been filled by John B. Erdman, whose term will be for the remainder of this year and for 1957. The appointment was made recently by the Walkerton Town Council.

Having served as Mayor of Walkerton for five years, Mr. Erdman brings a first-hand knowledge of municipal problems to his new post.

### Toronto Hydro Veteran Dies

William Porter Gordon, associated with Toronto Hydro for 33 years, died at Wellesley Hospital recently. A native of Scotland, Mr. Gordon came to Canada more than 50 years ago. A member of the 48th Highlanders Club, the regiment with which he served in World War I, and a leading Mason, he was also a Past President of the Toronto Hydro Veterans Association and a member of the Toronto Hydro Quarter Century Club.



## VOICE FROM THE PAST

**"D**IGNITY and Impudence" might well be the title for this photograph taken in the Chelsea Generating Station of the Gatineau Power Company about 15 miles north of Ottawa and supplied to Ontario Hydro through the courtesy of Allan Brown, Commercial Vice-President of the company. "You can hum and haw all you like," the little 1½-kilowatt dynamo at the right barks at the massive 25,400-kilowatt generator. "But where were YOU in 1885? I had to light up the mill of the Gilmore Lumber Company all on my own—right here in Chelsea on the very ground where you and your companions now hold sway. My output was only 20 amps at 60 volts. But I supplied current to the two arc lamps that illuminated the log-sorting booms above the mill. That got the industry really rolling." The big generator would have liked to tell its proud little progenitor to "take a jump in the tailrace," but was deterred by the presence of John Murphy (since deceased), who was the electrician of the Gilmore Lumber Company and prepared to champion this voluble relic of the early days.

### Windsor Honors Commissioner's Memory

In memory of a commissioner who died last year, a rose garden owned by the Windsor Utilities Commission has been named the Warren P. Bolton Memorial Garden. The name will be inscribed on a plaque to be placed on the fountain. Mr. Bolton served the commission for 13 years and was twice chairman, having an almost perfect attendance record at all commission meetings.

### Utility Sponsors Citizens' Tours

Citizens of London, Ontario, recently had the opportunity of gaining a more detailed understanding of the operations of their local utility when a series of six "open-house" tours were sponsored by London P.U.C. Enthusiastically attended by the public, these tours featured visits to the commission's various stations, as well as the showing of a 30-minute, color and sound film.



### **Named E.I.C. President**

Vernon A. McKillop, M.E.I.C., General Manager of the London Public Utilities Commission and of the London Railway Commission, has been elected President of the Engineering Institute of Canada. He took over the office from R. E. Hertz, M.E.I.C., at the Institute's recent annual banquet in Montreal.

Born in West Lorne, Ontario, Mr. McKillop received his degree in electrical engineering from the University of Toronto in 1924, after serving with the Royal Canadian Army Service Corps. Immediately after graduation, he joined the London P.U.C., where he has risen steadily to the post of General Manager, to which he was appointed in 1952.

Active in several engineering and service organizations, Mr. McKillop is a Past President of both the A.M.E.U. (1942), and the London Kiwanis Club (1953). He has been a member of the Engineering Institute of Canada since 1926.

### **SYMBOL OF POWER**

*(continued from page 3)*

as the chief means of distributing Niagara power," and particularly alternating current electricity, excited great interest and considerable controversy in the "nineties." Even Thomas A. Edison, the electrical wizard, was a staunch and uncompromising advocate of direct current at that time.

But, as the commemorative plaque in Brown's Hotel proudly proclaims, "the inauguration of the alternating current system at Niagara was followed by its adoption throughout the world." And Niagara — in the words of Mr. Adams, who was one of the principal figures in its development for power purposes — "still stands as a symbol of infinite power — a vision of infinite beauty — a shrine — a temple — erected by the hand of the Almighty for all the children of men." ■

### **Hydro Releases 25-Cycle Motors**

Through the presentation by Ontario Hydro of 30, one-quarter 25-cycle motors released from salvage, those attending the electrification school conducted by the Canadian Electrical Manufacturers' Association for the promotion of the use of electricity on the farm have had an opportunity of learning how to rewind such equipment for 60-cycle operation. The gift was made at the request of the Wagner Electric

Division of the Sangamo Company Limited, which supplied the necessary parts and wiring for conversion. The work was carried out under proper supervision and according to Hydro specifications.

### **Former Paris Commissioner Dies**

A member of the Paris Public Utilities Commission for 12 years, Richard Thomson died at Paris recently at the age of 92. He also served as President of District 5 O.M.E.A. for one term.



### **METERMEN'S COUNCIL**

THE Council of Metermen's Associations of Ontario recently held its regular biannual meeting at Ontario Hydro's Head Office in Toronto. Main topic of discussion was the newly-formed A.M.E.U. Metering Committee, which draws almost half its membership from the Council. Since its organization in 1952, the Council has aided considerably in developing better metering methods in Ontario by acting as a liaison group between the five Metermen's Associations of the Province. The Council's work consists largely of arranging schedules for association meetings, assisting in the preparation of program material, and disseminating knowledge from papers presented at these meetings. Members of the council seen in the accompanying photograph are: standing, left to right—Elliott McBroom, Toronto H.E.S.; Tom Honan, New Toronto P.U.C.; Vice-Chairman Roy Demerling, Windsor U.C.; Gordon Steiss, Kitchener P.U.C.; Al. Lawson, Sarnia H.E.C.; Mike Cook, Woodstock P.U.C.; Gordon Stacey, Guelph Board of Light and Heat Commissioners; Stan Upper, F.S.D., Ontario Hydro; and Norman Lake, Consumer Service Division, Ontario Hydro. Seated, from left to right, are: Al. Propper, Thorold P.U.C.; Alf. Hammond, Merritton H.E.C.; Chairman Clarence Labelle, Smiths Falls H.E.C.; Secretary-Treasurer Walter Percival, F.S.D., Ontario Hydro; and J. H. Page, Renfrew H.E.C.

# This and That

## Chesley's Enterprise

ALWAYS alert to the possibility of attracting new industries, Chesley, Ontario, has manifested the enterprise symbolized in the name of its progressive weekly newspaper by publishing an attractive promotional brochure. Our congratulations to the town and our sincere thanks to George Grabb, town clerk and secretary-treasurer of the Chesley Public Utilities Commission, who recently forwarded two copies of this profusely-illustrated booklet. Issued jointly by the Industrial Committee of the town council and the local public utilities commission, the brochure provides a wealth of information about Chesley. We are certain it will be useful to business or industrial firms in assessing the town's potentialities as a possible site for the location of a new industrial plant or commercial establishment.

## Quick Facts on Canada

SPEAKING of new booklets calls to mind the fact that the 1956-1957 edition of "Quick Canadian Facts" is now selling on local newsstands. Published in Toronto, the new issue is a literal storehouse of information on practically all aspects of Canadian life. Among thousands of other facts about Canada and Canadians that do not get into print frequently, we noted that the money spent on doctors' bills average out to \$35 a family each year; the amount spent in retail food stores averages out to \$900 a family in the same period.

## No Time for Cynics

ANY cynic who wants to gather evidence that the average citizen is a "heartless" individual would be better to scratch the name of St. Catharines off his survey list. He will get little assistance from line crews and commissioners of St. Catharines P.U.C. at any rate. On July 3 this year a severe storm struck the city causing heavy damage to the electrical system, involving a power cutoff. Crewmen of the local utility worked unceasingly for several hours to restore service. Instead of complaining about the lack of electricity, most citizens did what they could to assist the utility staff.

Reporting at a recent commission meeting, Superintendent Vernon May said "it was enough to bring tears to your eyes the way people brought out sandwiches and coffee to our boys during the storm clean-

up." Unanimous approval greeted a motion of Commissioner W. B. Elliott that the utility publish an advertisement in the *St. Catharines Standard* thanking customers for their forbearance and kindness during this trying period.

## Ladies on the Lines

THE GULF Telephone Company at Foley, Ala., has set a new pace in training its employees. "Rural Lines," published by the Rural Electrification Administration of the U.S. Department of Agriculture reports that when a girl gets a job with this company "she understands that a part of her training involves knowing everything there is to know about a rural telephone system. She drives trucks, operates a tractor, learns first aid, climbs poles and installs telephones. One day a trim little Southern Belle is tapping the keys on a typewriter. The next day, in blue jeans, she's pushing a truck down a dirt road.

"As part of her first aid course she goes to a slaughter house to get accustomed to the sight of fresh red blood. Some day she may be called upon to help save life in an emergency. She learns to use a rifle and a pistol and develop the confidence needed to master unusual situations." Watch out, men!

## A Good Friend — A Bad Foe

ALTHOUGH we are now into August, there is still ample time for swimming and other water accidents this season. So here are a few helpful hints from Ontario's Minister of Health, Dr. Mackinnon Phillips: 1. If you can't swim, stay away from deep water and out of canoes; 2. Never go swimming alone!; 3. Never enter the water directly after a meal. Stomach cramps may be caused by swimming too soon after eating. Allow at least one hour after meals before taking that dip; 4. Float on your back if you get a cramp in your leg or foot, and, on reaching shore, rub the affected part vigorously — ABOVE ALL, KEEP CALM!

Earlier this year Dr. Phillips estimated that perhaps close to 300 people would lose their lives in Ontario drowning accidents during the present summer holiday season. Last year, for example, 295 people were killed on highways in the three-month holiday period, while at the same time 258 perished in the province's lakes and rivers through drowning mishaps. ■



IN THE HOME



## Today's Living is measured in Kilowatt-hours

In this year, 1956, Ontario Hydro's Golden Jubilee, the modern home is not only light-conditioned, but work-conditioned by electricity. Electrical servants, many of them fully automatic, have made possible a higher, more comfortable standard of living for all. They cook; refrigerate; wash; dry; iron; polish and clean. It is difficult to name a routine household task where electric-

ity cannot, in some way, be of assistance.

Truly, today's living *is* measured in kilowatt-hours . . . and these are servant-hours. No matter where we look, electricity is at work making life easier and more enjoyable. Hydro will continue to provide an adequate supply of electricity to meet the power requirements of the province . . . power that means better living for all in Ontario.



"50  
YEARS OF PROGRESS"

THE HYDRO FAMILY ASSURES YOUR ELECTRICAL FUTURE



# MEMORABLE MILESTONES



**L**ONDON'S Western Fair this year (September 10-15 inclusive) will salute the Hydro Golden Jubilee with a special 78-foot exhibit sponsored by member municipalities of District 7 O.M.E.A. Ontario Hydro will also have a display in an adjoining booth. This has become a tradition at this famous fair, which has featured Hydro exhibits on frequent occasions over a period of almost 50 years. Back in 1911 and 1912 and in several subsequent years, Adam Beck and a group of Hydro engineers, including the late J. S. Lotimer and several others, set up displays of dairy apparatus, cooking utensils and small machines to demonstrate the benefits of electricity in the home and on the farm. This large booth under the grandstand at the 1912 Western Fair created widespread interest as the throng of visitors in the accompanying photograph readily indicates. Ontario Hydro's annual report for 1912 stated that engineers of the Commission and representatives of the local Hydro-Electric Department (now the London Public Utilities Commission) were "kept busy all day and late at night answering all sorts of questions as to the possible uses of the different apparatus exhibited, and the manner in which power might be obtained in their respective localities."





ONTARIO HYDRO

*News*

SEPTEMBER, 1956



ELECTRIC HELPER

# ONTARIO HYDRO

PUBLISHED BY THE HYDRO-ELECTRIC  
POWER COMMISSION OF ONTARIO  
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## WRITING HISTORY

THIS edition makes reference to a recent ceremony at Gogama, a northern Ontario community, marking the official inauguration of Hydro service.

While the link established between Gogama and the Hydro system is a comparatively modest event in Commission annals, the hearty welcome extended by the residents of this rail and lumbering centre emphasized a popular recognition of the inherent benefits of reliable electrical service.

The civic rejoicing that marked Gogama's new status was typical, too, of the attitude manifested in several northern communities where electrical facilities have been established in recent years. In recalling the expansion of the Hydro system in northern Ontario, such names as Noelville, Wikwemikong, Killarney, Kapuskasing, Hearst, Iron Bridge, Blind River, Ignace, Manitouwadge, Chapleau and others come to mind. While some of these communities had been provided with electrical service previously, the connection with the province-wide Hydro system has furnished a new and acknowledged impetus to their development.

Commenting editorially on Gogama's association with the Hydro family recently, the *Sudbury Daily Star* pointed up the fact that it marked "a giant step" from the days when electricity was produced by small gasoline or diesel-driven generators. Gogama's connections with the "outside world" through the recently-completed Hydro line and a new road built in 1953 by the Ontario Department of Mines, are significant auguries of "the future importance of this region," the *Star* stated. Continuing in this vein, the influential Nickel Belt journal stressed that "an unfailing source of electric power and improved highway facilities are two of the major requisites for community development."

Reviewing Hydro's progress in the harnessing of northern Ontario power sites, the *Star* saluted the Commission's achievements with this final observation: "It would not be trite to say that Hydro and northern Ontario municipalities are partners in meeting the challenge for the economic development of the province. Hydro can already look back on 50 years of achievement in this, its Golden Jubilee year. The north and Hydro will write provincial history in the next 50 years."

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## COVER SHOTS

THIS month in the leading article, "Rural Beacons," *Ontario Hydro News* recounts highlights of the story of Adam Beck's early campaign to encourage the use of electricity on the farm. Indicating how well he and the Hydro staff did their work is the fact that today, as Hydro celebrates its Golden Jubilee Year, some 87 per cent of Ontario's farms are served with electricity. Easing and speeding many tasks around the barn and in the house, electricity has approximately 400 possible applications on the modern farm, such as the electric bale conveyor depicted on the front cover.

Hydro's famed floral clock at Queenston, in its Golden Jubilee dress, is our back cover subject this month.



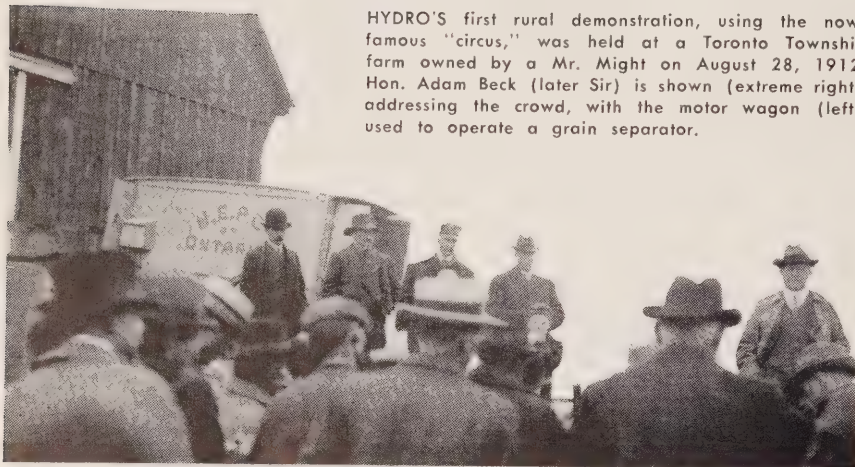
## SUBMARINE TUNNELS

ACCESS to the powerhouse work area at Ontario Hydro's St. Lawrence Power Project has become relatively simple with the recent completion of a second set of tunnels. When work started two years ago, two tunnels were excavated under the Cornwall Canal to facilitate traffic and movement of materials and equipment to the powerhouse site without interruption to navigation. Construction of a new diversion canal (adjacent to the existing canal), which will carry water traffic when the 1957 navigation season opens, has necessitated the building, in recent months, of another pair of tunnels to serve an identical purpose. In this

unusual photograph the finishing touches on the paving of the roadway between the larger of the new tunnels and its older counterpart (in the background, left) are in progress. The larger tunnels, each 16 feet in diameter, carry vehicular traffic up to 22-ton diesel trucks, while pedestrian traffic, an aggregate conveyor system, a pipe for blowing dry cement by compressed air, as well as telephone and power cables, are routed through the 10-foot passages (the original small tunnel is partially visible in the background). The tunnels are lined with multi-plate, corrugated steel pipes anchored to concrete pads.



# Golden Jubilee Flashback



HYDRO'S first rural demonstration, using the now-famous "circus," was held at a Toronto Township farm owned by a Mr. Might on August 28, 1912. Hon. Adam Beck (later Sir) is shown (extreme right) addressing the crowd, with the motor wagon (left) used to operate a grain separator.

## RURAL BEACONS

by H. M. Blake

Demonstration farms in western Ontario laid the foundations for

Ontario Hydro's vast electrification project over the past half-century

IN THE spring and summer of 1911, certain novel proceedings in the southwestern counties of the province evoked criticism from the then formidable opponents of Ontario Hydro and caused some concern even to its supporters. Not content with bringing Niagara power to urban municipalities — considered by many to be a doubtful experiment in itself — Adam Beck was providing services to farmers.

Revisions to the Power Commission Act, which received Royal assent on March 24, 1911, enabled rural townships under certain conditions to contract for power with Ontario Hydro and, with the financial assistance of the Commission, to establish electrical distribution systems. This meant that they could give services to farmers and other residents within their borders.

As far as the farmers were concerned, it was an experimental, pioneer undertaking — the first of its kind in North America — and Adam Beck was astute enough to see that, alone and unaided, it was unlikely to produce very fruitful results. What was needed to support the venture and make it a stepping stone in the difficult path of electrification was a number of adequately-equipped demonstration farms, which could be conveniently supplied with all the power required to fully reveal the advantages and benefits that Hydro could bring.

Investigation led to the selection of three farms in the St. Thomas area, some five or six in the vicinity of Ingersoll and one near Preston.

Sir Adam secured the co-operation of the municipal systems by promising Ontario Hydro's assistance in construction costs. The rates set for these "demonstration" farms often were irrespective of the amount of electricity used, and designed to encourage the farmers to install all available electrical equipment.

### First Farms Served

The first Hydro services were given to three farmers near St.



Thomas in April, 1911, through extensions run out from the St. Thomas municipal system. The farms were owned by Charles E. Locke, Richard Penhale and Alexander Anderson. Percy E. Locke, a present commissioner of the St. Thomas P.U.C., of which he has been five times chairman, recalls that his father introduced a Hineman milking machine, an immersion type of hot-water heater for washing the milking utensils and an electrically-driven grain grinder. An electric cooker was installed in the farmhouse kitchen and Mrs. Locke was provided with an electric iron and some home-made devices to lighten her work.

The Penhale and Locke families had come out from Devonshire, England, in 1837. They settled on half-cleared Clergy Reserves' land in the old Talbot settlement. From time to time, beef and dairy cattle were brought out from England and many of them sold to improve the strain of local herds. Mr. Anderson purchased his farm near St. Thomas after he moved from Woodstock around the turn of the century. The Locke and Anderson farms were used for some of the most important Hydro demonstrations ever held. In the fall of the same year, after Hydro service was installed, Mr. Penhale received the Province of Ontario cup awarded to the cleanest and most modernly-equipped farm in the province.



In recent years, the rapidly expanding suburbs of St. Thomas have invaded most of the land comprising the old Locke and Penhale farms and are threatening the Anderson farm, which is the only one of the three with the barns still standing.

#### Ingersoll Farms

Located on what is now Rural Route No. 1, leading out from Ingersoll, is a farm which was carved out of virgin forest and cedar swamps by David Clark, the son of a United Empire Loyalist, who had come all the way from New Brunswick to found a new home. In the spring of 1911, it was a well-cleared farm of lush pastures and seeded crops.

Coming out from his chores in the barn one quiet evening, D. W. Clark, a grandson of the original settler, heard a bell in Ingersoll — two miles distant — tolling the hours. He counted the strokes. It was ten o'clock.

"Should have been in bed two hours ago," he told himself, "got to be up before five tomorrow."

His thoughts reverted to Ingersoll. They had Hydro service there now and the people were enthusiastic about it. If it did only half of what they said it could do, he could use it on his farm. Next day he harnessed a horse to the buggy and drove into town. The local electrical department, with a paternal, protective gesture, turned him down. Even if permission were received to serve him, it would cost too much. Better buy feed with his money.

Mr. Clark — still working on his farm at 83 years of age — recalls this visit with a laugh.

"Heck, I wasn't a kid gone crazy about a new toy," he says. "I wanted Hydro, particularly for silo filling — we had a lot of dairy cattle in those days—and there were a lot of other things I knew it would do, too. Somebody must have put in a good word for me" — one can imagine who it was — "because they got a service through to me that very June."

Before the summer was over, the  
(Continued on page 4)

OWNER of one of Ontario's first electrified farms (used for early Hydro demonstrations), M. W. Keefer inherited the land from his aunt, Miss Catherine Wilkes. Once famous for its standard-bred horses and now for its Hereford cattle, this fine farm received Hydro service from Preston in January, 1912.







△  
 ◁ ST. THOMAS school children were given a holiday to see this rural Hydro demonstration (above) on the farm of Alex Anderson (left), one of three farms served by St. Thomas.

other farms Adam Beck had in mind in the district, just as he had anticipated, petitioned the Ingersoll utility for Hydro service. After an agreement had been reached on construction costs and customer rates, the necessary permission from Ontario Hydro, which the municipality had believed might be difficult to obtain, was cheerfully accorded. Included was a farm then owned by John Prouse, which, in recent years, has passed into the possession of P. M. Dewan, a Minister of Agriculture in a former Ontario Government. It was used by Beck for the first public demonstration of silo filling in the province. An adjoining farm, owned at the time of the first Hydro service by a

Mr. Wilson and also since acquired by Mr. Dewan, was the first to install the type of modern milking machine now in common use on dairy farms in southern Ontario.

Other farms in the Ingersoll district receiving Hydro services in 1911 were the William Bowman farm, now owned by H. C. Wheeler; the J. G. Edwards farm, since purchased by Brod Edwards and the John Lee farm now owned by Harold Dufty.

#### Serving A Famous Establishment

In the neighbourhood of Preston was perhaps the oldest farm of all. It had been carved out of the wilderness by a man named Ashton whose antecedents have been lost in the passage of time. It is understood, however, that he built a log cabin and a brewery there early in the

19th century. The property was acquired by Matthew Wilkes, who came out from England about 100 years ago, and converted it to pasturage and crops. Mr. Wilkes left it to his daughter, Catharine Wilkes, and the farm became famous for its standard-bred horses, which were shown in racing harness at most of the fall fairs in southern Ontario.

Adam Beck, who owned a stable of prize-winning show horses himself, was much interested in Miss Wilkes' activities. He had her farm down on his list for demonstration purposes. Lines were built out from Preston in December, 1911, and first electric services were provided in January, 1912.

Miss Wilkes left her farm, which has much the appearance of ar



English country estate, to her nephew, M. W. Keefe, who now raises Hereford cattle. Mr. Keefe has what might be described as a completely electrified farm. Practically no device which will assist in the work around the farm or the keeping of the barns and stables in a sanitary condition has been omitted.

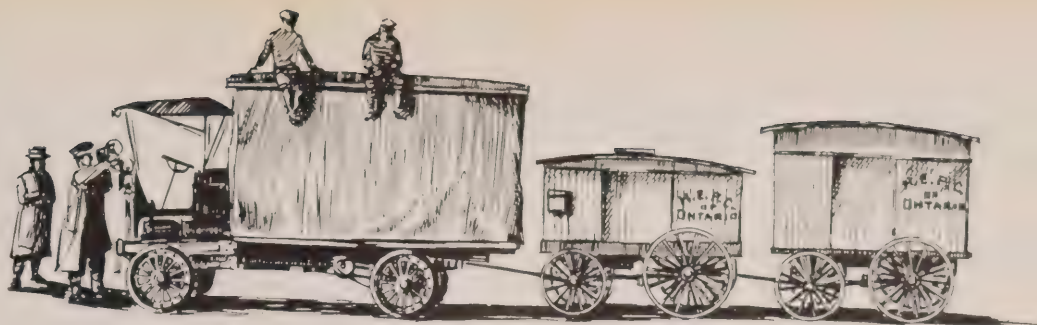
### Early Hydro Demonstrations

The experimental services given to these farms, and to several others a few months later, were followed up in the late summer and fall of 1912 by Hydro exhibits at the Canadian National Exhibition and county fairs and with demonstrations by the "Hydro Circus," a travelling "power caravan," which visited farms showing how silo filling, milking, the manifold chores around the barn and even threshing might be effectively carried out by the use of electricity.

Often with the assistance of the "Hydro Circus," demonstrations of the use of electrical apparatus and equipment were given at the C.N.E., at the Western Fair, London; at Norwich, at the famous old fair at Woodstock, at Weston, Tillsonburg, Markham, Dundas, New Hamburg, Stratford, and St. Marys. Divided into two sections, the "circus," after test demonstrations at two farms in Toronto Township, visited two farms in North Dumfries Township, two in Wilmot Township, one in Hibbert Township, two in South Yarmouth Township, two in Dereham Township, two in North Oxford Township, four in West Oxford Township, two in North Norwich Township and one in South Norwich.

Typical of the Hydro exhibitions was the one given at the Norwich Fair held September 16-17, 1912.

The domestic utensils and appli-



ances were displayed on a raised platform inside the main building. They consisted of a range, an electric fireless cooker, a motor-driven washing machine, vacuum cleaners, coffee percolators, electric soldering irons, fan motors, tea kettles, electric tea samovars, electric dishes, electric flat irons and curling irons, toasters, cigar lighters, an automatic electric pump and a cream separator. A demonstrator was in attendance to operate the equipment and to explain the advantages to be derived from the use of electricity for cooking.

The farm machinery was set up in a tent outside. It consisted of automatic pressure pumps, a jack for adapting the ordinary farm pump to an electric drive, a turnip pulper, a circular saw, an electrically-operated milking machine and a small electrically-driven thresher. All this equipment was shown in actual operation.

### First Direct Commission Service

In 1913, the parent Commission constructed a transmission line running from Baden through Petersburg to an orphanage at St. Agatha and two farmers in close proximity to the orphanage received service. Their names are recorded as Kniffel and Lautenslaugher. They were the first farmers to be served directly by Ontario Hydro.

In most instances, however, services to farmers continued to be carried out through the agency of the municipalities and townships until 1920, when amendments to govern-

*(Continued on page 6)*



△  
MANAGER J. C. Ferguson, Ingersoll R.O.A. (left), with Leslie Wheeler, inspects the fuse box installed in 1911 when the Ingersoll district farm received electrical service.



△  
SPRINKLING strawberries with electrically-pumped water, D. W. Clark recalls that his farm was the first in the district to receive Hydro service from the Town of Ingersoll in 1911, setting a new trend in that area.

ment legislation divided the province into rural power districts and enabled Ontario Hydro, which had been carrying on an intensive campaign, to set up rural operating areas and provide direct services to districts where an average of three farms to a mile had been signed up on long-term contracts. Expansion was, however, handicapped by the high service charge which was necessary to meet the cost of rural construction. In 1921, the government made a grant-in-aid, contributing 50 per cent of the capital cost of primary line construction, and in 1924 this assistance was extended to cover the cost of secondary lines as well. The Commission was then in a position to embark upon the progressive programs of rural expansion that it had long had in view.

By 1923, the Commission had built 1,058 miles of rural line and was serving 3,822 farm customers. At the end of 1939, the year which

marked the beginning of the Second World War, Ontario Hydro had built 17,706 miles of rural line and there were 53,240 farms on its rural roster. During the war years there was naturally a deceleration in the pace of rural construction. There were, however, a number of farms which were given electrical service because they were leading food producers. At the end of 1945, the total rural mileage stood at 21,569 miles and farm customers at 65,141.

### Phenomenal Rural Programs

A few months after the end of the war, Ontario Hydro initiated the tremendous programs of rural construction, which, regarded as the undertaking of a single power producer, have been unequalled on the North American continent. By July 31, 1956, a total of 424,156 rural customers (including 138,449 farm-service type) were being served over 44,027 miles of rural line.

Accompanying this phenomenal rural development by Ontario Hydro has been the periodic reduction, and finally, on January 1, 1944, the elimination of the farm service charge. As far as the cost of consumption of electricity is concerned, notable reductions have been made, particularly since 1928, when the average cost per kilowatthour to the farm customers was 5.187 cents. At the end of 1955, it was only 2.163 cents. Perhaps the greatest achievement of all has been the establishment of a uniform rate for similar types of farm services.

And so from the beacons lighted in 1911—regarded by Hydro critics as doomed to early extinction—and from the demonstrations carried out in the following year, has spread a radiance, illuminating the rural areas of the province and bringing to the farmer relief from his ancient drudgery and a standard of living comparable to that enjoyed in urban communities. ■

DURING the first rural Hydro demonstration in 1912 (see title photograph) an expert demonstrator served toast, tea and coffee, prepared on the electrical appliances carried on the "circus" truck (centre foreground).





# OPEN HOUSE

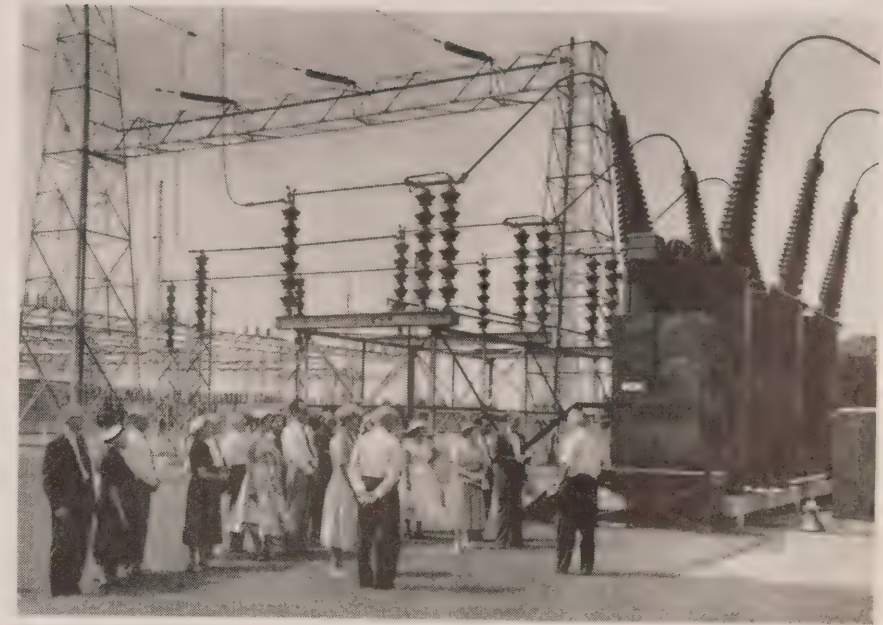
## E. V. Buchanan Transformer Station provides impressive background for Hydro Golden Jubilee ceremony

AN IMPORTANT focal point in Ontario Hydro's southern Ontario power complex — the E. V. Buchanan Transformer Station near London — provided an impressive setting for a special observance of Hydro's Golden Jubilee on August 11 this year.

Under the capable auspices of the Commission's Western Region, this Golden Jubilee celebration took the form of an "open house" for municipal Hydro officials in District 7, Ontario Municipal Electric Association, members of the executive of District 8, O.M.E.A., Ontario Hydro staff, as well as industrialists and representatives of press, radio and television in the area.

Welcoming guests, Western Region's Manager, R. M. Laurie, announced that the station would be open to the public on Saturdays and Sundays during August. Later this fall, he continued, visits to the station would be arranged for children attending schools in the area "to let them know about Hydro and its important part in the life of the province."

A highlight of the recent anniversary event was a tour of the extensive station property where the 150 or more guests gained a new appreciation of the plant's vital functions in transmitting power to the municipalities, industries and rural areas of western Ontario. Enroute the visitors inspected the station's large control room, frequency changer building and the



ERIC Pogel, station Supervisor (right), explains the operation of a 230-kv. circuit breaker to a group of visitors — one of several groups touring the E. V. Buchanan Transformer Station during the "open house."



GORDON H. Fuller, O.M.E.A. President, was among the guest speakers at the Golden Jubilee ceremony.

switching areas. At various points, experienced guides explained the role of such massive pieces of electrical equipment as frequency converters, transformers, circuit breakers and other auxiliary facilities in controlling the flow of power from Niagara River generating stations

and plants as far distant as the Ottawa River.

Guests, too, had an interesting look at the homes of 50 years ago during their inspection of the frequency changer building. Here they had a special preview of an

*(Continued on page 8)*



INTERESTED spectators while Marilyn Turner (centre) explained the function of the transformer station by means of an illuminated wall diagram were Mr. and Mrs. E. V. Buchanan (left), Prof. J. L. Wild, London, and Western Region Manager R. M. Laurie (right).

exhibit prepared by District 7 O.M.E.A. for London's Western Fair (September 10-15), reflecting the progress made in the design and development of electrical appliances over the past half-century.

### Antique Kitchen

An old-style kitchen, equipped with an early electric range (an oak-finished Copeman type); a venerable electric washing machine, ice-box and other appliances of five decades ago competed for spectator interest with its glistening 1956 counterpart displaying virtually every electrical kitchen device available today, including an electronic range, shown for the first time in the London area.

An authentic parlor of the 1906 era, with such novel items as an Edison phonograph, an even more ancient "Melodian" bearing an original patent date of 1877, and a hand-operated vacuum cleaner demonstrated the welcome changes in "every day" living when contrasted with an adjacent 1956 play room. Equipped with the latest in furniture, lighting fixtures, television, radio and high-fidelity record-player sets, as well as the more functional types of electrical equipment, such as vacuum cleaners, this tastefully-arranged room won many

plaudits — particularly from the distaff side.

Recalling London's intimate association with Hydro's early days was a collection of some of the personal effects of the late Sir Adam Beck, the Commission's first Chairman. These mementoes of the colorful career of the "Hydro Knight" included the regalia he wore and the warrant and seal he received when his knighthood was conferred by King George V in 1914.

Climaxing the tours was a brief ceremony in a picturesque wooded setting against the impressive backdrop of high tension lines that criss-cross the station property. With Mr. Laurie as Master of Ceremonies, the audience heard such speakers as E. V. Buchanan, former General Manager of London P.U.C., A. A. Kennedy, Ontario Hydro Commissioner, and Gordon H. Fuller, O.M.E.A. President, recall Hydro's half-century of service to Ontario.

Surveying the important property, which was renamed in his honor by Ontario Hydro in 1950, Mr. Buchanan traced the origin of 25-cycle power in the province. Introduced by J. S. Killingsworth,

Chairman, London P.U.C., and President, District 7 O.M.E.A., the speaker pointed out that the 25-cycle frequency was adopted as a compromise between 16  $\frac{2}{3}$  cycles advocated by engineering consultants to the companies which built three early plants along the Niagara River, and 33  $\frac{1}{3}$  cycles proposed by the electrical equipment manufacturers of that period.

Thus, Ontario Hydro inherited 25 cycles when it began to purchase hydro-electric power from these Niagara Falls power companies around 1910. Later when the Commission built plants in other sections of Ontario, 60-cycle generators were installed.

The best technical experts available 70 years ago advised 25 cycles, Mr. Buchanan continued. Today, the common frequency is 60 cycles, "but 50 years from now, with the striking technological advances that probably will be made in the coming years, who can say what the frequency will be?"

Paying tribute to Hydro's handling of the frequency standardization program, Mr. Buchanan emphasized that it was "a fantastic undertaking and the largest of its kind in the world."

Turning from this aspect of Hydro operations in Ontario, he dealt briefly with the growth of the City of London and its numerous contributions to the development of Ontario's publicly-owned Hydro system. Recalling that the city's first agreement with Ontario Hydro called for the delivery of only 3,500 horsepower, he said that power consumption in the city today is virtually 23 times the original contract.

Eulogizing the citizens who had



served on the London Commission since its formation, this dean of Ontario engineers cited the excellent financial position of the London Commission today as an example of their good administration. "London (Hydro) rates are among the lowest in the province and actually one-tenth those of the London Electric Company (which served the city before the inauguration of Hydro service), even without taking monetary inflation into account."

Calling on his background of more than 40 years' association with

the London P.U.C., the speaker also referred to the "aggressive policies" introduced by the utility in selling appliances "to make Hydro pay." In 1911, he pointed out, London opened "the first Hydro shop in the province." The shop soon became a thriving business — grossing over \$250,000 in a year.

London also pioneered the movement to place Hydro, telephone and telegraph lines underground. "Today the city has more miles of underground cable per capita than any city in Canada — including the first low-voltage network and

the first all-underground distribution facilities in a residential subdivision."

London Commission engineers also introduced designs for a new type of domestic water heater, manufactured in the city, which was installed in city homes on a rental basis with a separate, remote-control system. "The work, thus created, helped, to a degree, to relieve conditions imposed by the last depression and started a movement that spread to other parts of the province."

### O.M.E.A. Contribution

Introduced by A.M.E.U. President, E. A. Washburn, Stratford. Mr. Fuller, President of the O.M.E.A., said that the association had drawn "a great deal of satisfaction from the many tributes paid to Ontario Hydro on attaining the 50th milestone in its life of public service."

This satisfaction, he said, was derived, to a great extent, from the fact that the O.M.E.A. was the "godparent" of the great Hydro family.

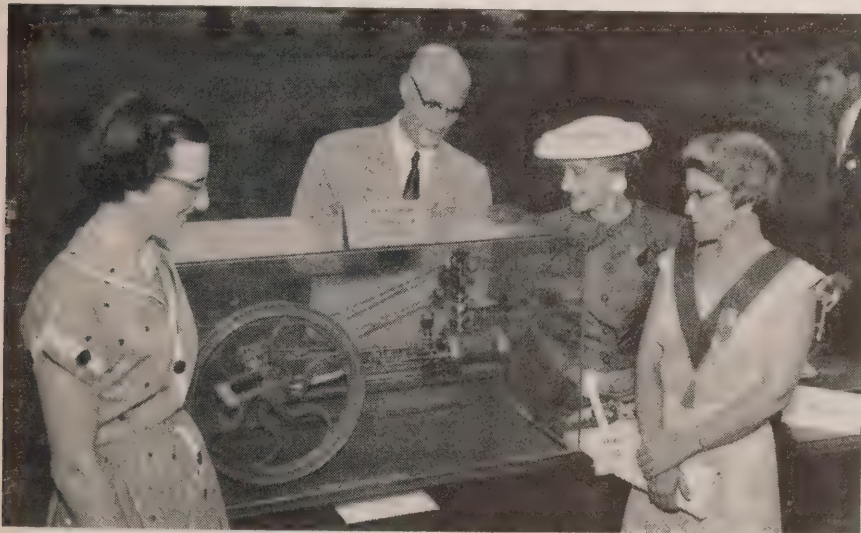
Tracing the history of the association from its inception as the Niagara Electric Power Union, early in the present century, Mr. Fuller said the Union had conducted a campaign under the leadership of Adam Beck that was largely responsible for laying Ontario Hydro's foundations.

Reorganized on a wider basis under its present name, the O.M.E.A. had been a partner with Ontario Hydro in its long record of achievements.

"Tangible recognition of the important public service rendered by the O.M.E.A. and the contribution it has made to the progress of Hydro in Ontario was the appointment last year of Lt.-Col. A. A. Kennedy as an Ontario Hydro Commissioner representing the municipalities while he was still serving as President of the O.M.E.A."

*(Continued on page 26)*

C. E. KIRKBY, Woodstock, discusses a model of a steam engine, made by Adam Beck in 1870, with Mrs. W. R. Mathieson, left, Mrs. Gordon H. Fuller and Mrs. E. A. Washburn, Presidents of the Ladies' Auxiliaries of the O.M.E.A. and A.M.E.U. respectively (right). The model was among a collection of mementoes, which recalled the colorful career of Hydro's first Chairman.



RUTH KEMP (right) demonstrates the manually-operated Melodian (patented in 1877), for Mrs. Gordon Hilborn, Grand Bend (left) and Mrs. John Tuerkheim, Zurich, in the old-style parlor.







CHIEF participants in the Toronto memorial service, left to right, J. G. Baldwin, O.M.E.A.; Ontario Hydro Commissioner A. A. Kennedy, Dr. V. S. Wilson, District 4 O.M.E.A.; Mayor Nathan Phillips, Toronto; Rt. Rev. G. B. Snell, Suffragan Bishop of Toronto; President Bert Merson, District 4 O.M.E.A., who was chairman at the service; Hon. William Griesinger, Ontario Minister of Public Works; G. R. Davis, Kingston, A.M.E.U., and John McMechan, Toronto Hydro, stand at the base of the Sir Adam Beck statue.

# “IN ALL HUMILITY”

**Hamilton and Toronto ceremonies recall achievements and notable career of Hydro's first Chairman**

ONTARIO paused on August 15 this year to pay humble tribute to the memory of the chief architect of its publicly-owned Hydro enterprise.

The 31st anniversary of the death of Sir Adam Beck, Ontario Hydro's first Chairman, was invested with special significance as grateful citizens recalled his achievements exemplified in Hydro's Golden Jubilee observances.

Fittingly enough the ceremonies arranged in memory of the province's "Knight of Illumination," were sponsored by representatives of Ontario's municipalities in whose interests he labored long and faithfully.

At Hamilton Cemetery, officers

and members of District 5 O.M.E.A., Gordon H. Fuller, O.M.E.A. President, E. A. Washburn, A.M.E.U. President, Ontario Hydro and municipal Hydro representatives and private citizens gathered at Sir Adam's graveside to pay, as Hydro's present Chairman, Dr. Richard L. Hearn stated, "our respects to the man who was, more than anyone else, responsible for carrying to fulfillment the dream of low-cost power for the people of Ontario."

Voicing the conviction that a day had not passed in the 31 years since Sir Adam died when "we are not aware of the imperishable contribution he made to Hydro," Dr. Hearn said the acknowledgement that his

influence is still felt so long after his death is perhaps the greatest tribute that can be paid to him today.

## **Rich Inheritance**

Sir Adam devoted much of his life to serving the people of this province, Dr. Hearn continued, "and to us has come a rich and wonderful inheritance. With this knowledge, I am sure that we stand here in all humility to honor his name, his work and his vision."

The memorial service arranged by Hamilton Hydro-Electric Commission was conducted by Ven. Archdeacon W. F. Wallace, of Hamilton, beside the simple granite shaft that marks the graves of Sir Adam and





△  
MUNICIPAL and Ontario Hydro representatives joined with civic officials at the grave of Sir Adam Beck in Hamilton Cemetery where a service was held to commemorate the 31st anniversary of his death.



△  
PAYING tribute to Sir Adam's memory and his achievements, Hydro Chairman Dr. Richard L. Hearn (left) and O.M.E.A. President Gordon H. Fuller were among those placing wreaths on the grave at Hamilton.

Lady Beck. As tangible tokens of respect, wreaths were laid by: Dr. Hearn on behalf of Ontario Hydro; Gordon H. Fuller, President, O.M.E.A.; E. A. Washburn, President, A.M.E.U., and C. R. Drynan, Chairman, Hamilton Hydro-Electric Commission. In dedicating the wreaths, Archdeacon Wallace said Hydro had become a monument to Sir Adam's pioneering efforts in public ownership.

"It is so easy now to admire the great works of Hydro; in Sir Adam's day it took great vision to plan them."

Following the memorial services, a reception and luncheon were held at the Royal Connaught Hotel. As host, C. R. Drynan, on behalf of Hamilton Hydro, welcomed the group of more than 125, which included representatives of Ontario Hydro and municipal Hydro commissions, the Niagara District Electric Club, Mayor L. D. Jackson and other members of the Hamilton City Council.

In paying tribute to Sir Adam's memory, Mayor Jackson said he

found something unique about the group gathered to honor a man whose contributions had been made so long ago.

"I find this attitude commendable in view of the fact that so many people seem to be displaying a general lack of appreciation for those who have served so well in the past," Mayor Jackson stated.

In a brief address, Hon. W. K. Warrender, Q.C., Vice-Chairman, Ontario Hydro, paid this tribute: "While Sir Adam Beck's name has been perpetuated in many ways, the most enduring monument to him is the high standard of living we enjoy in this province today. In our gratitude let us never become complacent. It is our responsibility to pass along a still greater Hydro heritage, enriched in tradition and strengthened by our own efforts."

Short addresses by the Presidents of the O.M.E.A. and A.M.E.U. brought the ceremony to a conclusion.

#### Toronto Ceremony

The Hamilton memorial services coincided with a similar impressive

tribute to the "Hydro Knight" in Toronto arranged by officers and members of District 4 O.M.E.A.

Officiating at the service, Chairman Bert Merson, Toronto Electric Commissioners, President of District 4 O.M.E.A., introduced Hon. William Griesinger, Ontario Minister of Public Works, who represented Hon. Leslie M. Frost, Prime Minister, and members of the Executive Council of Ontario.

The monument to Sir Adam on University Ave. formed a perfect setting for such a service. Attended by Ontario Government, municipal Hydro and Ontario Hydro representatives from many sections of the province, as well as Toronto and district civic officials, the memorial ceremony witnessed the laying of wreaths by: Dr. V. S. Wilson, District 4 O.M.E.A.; Commissioner A. A. Kennedy, Ontario Hydro; Mayor Nathan Phillips, Toronto; John McMechan, Vice-Chairman, Toronto Hydro; G. R. Davis, Kingston, Vice-President, A.M.E.U., and

*(Continued on page 23)*

# 40th Anniversary

**Point Edward marks important milestone with the official  
inauguration of its ultra-modern public utilities building**

**C**ELEBRATING the 40th anniversary of its association with Ontario Hydro, Point Edward marked this important occasion with the recent opening of an ultra-modern public utilities building.

The handsome, single-storey structure, strategically located at the intersection of the village's two main thoroughfares — Michigan Avenue and St. Clair Street — stands on attractively-landscaped grounds. Designed to serve the utility's needs for many years, the building also presently accommodates the Point Edward municipal and police offices.

Cutting the blue and gold ribbon across the main door with a pair of gold scissors to officially open the new utility and municipal headquarters, Gordon H. Fuller, Windsor, President of the O.M.E.A., said: "This building stands as tangible evidence of your faith and confidence in the community and its future."

Stressing that each municipal utility had particular problems not experienced in other communities, Mr. Fuller said that these problems must be solved in a manner that will be acceptable to the customers. The O.M.E.A., on the other hand, "can be made the clearing house for our common problems."

Continuing, he pointed out that the parent association represents a cross-section of province-wide thought and opinion, while the district associations of the O.M.E.A.

provide a channel for local or regional points of view.

Attendance at many O.M.E.A. meetings had indicated to him that some of the finest leadership was being provided by commissioners from smaller communities, Mr. Fuller stated.

Turning to the subject of Hydro's Golden Jubilee, the O.M.E.A. President expressed the view that Hydro could perform valuable service to humanity in the next 50 years.

## **Fortunate People**

"Given the same type of direction that has guided Hydro through its first half-century and characterized its development for five decades, we can rest assured that the millions of citizens then living in this province — from the viewpoint of electrical service at least — will be a fortunate people indeed."

Presiding at the official opening ceremonies, Reeve J. M. Lea, Chairman of Point Edward P.U.C., in introducing W. Ross Strike, Q.C., Vice-Chairman, Ontario Hydro, said "the building is the nerve-centre of this community. It is the fulfillment of a dream of commission and council members, both past and present, who had the foresight to erect such a centre to serve the public."

## **Electrical History**

Reeve Lea, tracing the history of electrical service in Point Edward, said that the first power was de-

livered by Ontario Hydro in November, 1916 through the Sarnia Hydro-Electric Commission. Previously the village had been provided with power by a private company operating a steam generating plant in Sarnia.

In 1923 the village began operation of its own system, opening an office at Point Edward in 1939. In 1953 a public utilities commission was formed to administer both Hydro and water services in the growing community. Paying tribute to such municipal officials as former Reeves David Ross and Ralph Burr, Reeve Lea said that their efforts and interest were largely responsible for the fact that the municipality could erect this new public building free of debt.

## **Reflects Expansion**

Extending congratulations to the community on behalf of Ontario Hydro, Mr. Strike said that the new headquarters reflected the expansion taking place in Ontario and the increasing demands for electrical service in every sphere of activity throughout the province.

Also participating in the ceremonies attended by some 100 Point Edward and Sarnia citizens and guests from outside points, were Rev. E. E. Egilsson, Rev. G. G. Stone and Rev. J. F. Bell. Introduction of the guests was capably handled by Commissioner F. G. Tigwell while J. T. Barnes, Sarnia, President





△ O.M.E.A. President Gordon H. Fuller cuts the ribbon across the main door to officially open the new utility building (shown below). Standing behind Mr. Fuller (photo, left) is J. M. Lea, P.U.C. Chairman, who presided at the ceremony.



of District 8 O.M.E.A., introduced Mr. Fuller.

Climaxing the ceremonies, the guests toured the building where they were greeted by Manager J. A. Bannister and his staff. Many admiring comments were heard during the inspection of the main utility office, with its mahogany-panelled entrance, matching mahogany counters and pastel walls. A private board room, panelled in walnut veneer and equipped with matching walnut furniture, was also on the inspection itinerary.

With provision for a second storey when necessary, the new building represents a pleasing addition to the roster of Point Edward's public edifices with its tastefully-combined concrete and brick construction. Ample natural lighting is provided by glass walls on two sides of the building. Floors of the new structure, which is equipped with perimeter heating and air-conditioning, are of concrete slab, with the public lobbies in terrazzo and tiled flooring in the office areas. Other facilities of the ultra modern building include a large attached garage to accommodate truck equipment, which, it is anticipated, will be required in the near future.

Following the tour of the building, guests were entertained at a reception. The commission also sponsored an "open house" for the public as part of the official opening ceremonies. ■



COMMISSIONER Thomas McCord pins a corsage on a guest during the special "open house" for citizens.



MEMBERS of Point Edward P.U.C., left to right, Commissioner F. G. Tigwell, Chairman J. M. Lea, Commissioner McCord, and Manager-Secretary J. A. Bannister attend the first meeting in the board room of the new building.



# AT THE HALF-WAY POST

Significant construction advances made by Ontario Hydro work

forces in all sections of international hydro-electric project

ON AUGUST 10 this year the joint engineering construction team at Hydro's St. Lawrence Power Project celebrated the second anniversary of the now-famous development with an encouraging prediction.

Speaking on behalf of the Ontario Hydro group, Director Gordon Mitchell said they were "near the middle of the work schedule . . . aiming at August, 1958 for the first power delivery."

Since the first sod was turned on August 10, 1954 to officially inaugurate construction at the 1,640,000 kilowatt hydro-electric project, the work forces of Ontario Hydro and the Power Authority of the State of New York — the joint partners in the impressive scheme — have been accomplishing miracles in solving complex engineering problems and pushing ahead to meet construction deadlines.

The first work on the development was to block the north channel of the St. Lawrence and divert all the water through the channel south of Barnhart Island. This was accomplished by cofferdamming the river in the upstream portion of the channel, between Sheek and Barnhart Islands with a rock-filled dam. Later, one of the world's longest

steel-cell cofferdams was constructed between the Canadian mainland and the northeastern end of Barnhart Island, sealing off that 2½-mile portion of the channel. Just a little more than a year ago, this 2½-mile section of the river was pumped out, with approximately 650,000,000 gallons of water being discharged into the lower river by huge electric pumps to dry up the river in less than five days.

At this point, the project entered the first important phase of permanent construction. Great activity commenced behind the steel-cell cofferdam, with the contractor excavating in the river bottom for the foundation of the main dam, which is being built to include the powerhouses.

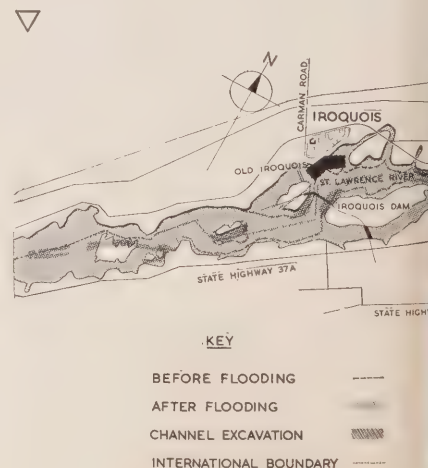
## Powerhouse Construction Progress

Work now is concentrated on building Ontario Hydro's powerhouse structure. A total of approximately 190,000 cubic yards of concrete (380,000 tons) has, to date, been put into permanent installations, including the "U" abutment, wing wall, ice sluices and the bases for six generating units. This affords a real contrast with the work stage a year ago, when first excavation had just commenced.

It is anticipated that the tempo of work will be accelerated in the months ahead, as construction in the powerhouse area advances away from the congested north-end sector. Three big gantry cranes for handling concrete are now erected. Beneath these cranes, railway trains will be operating to speed the concrete to the placing areas. A fourth gantry crane will be added this fall.

*(Continued on page 16)*

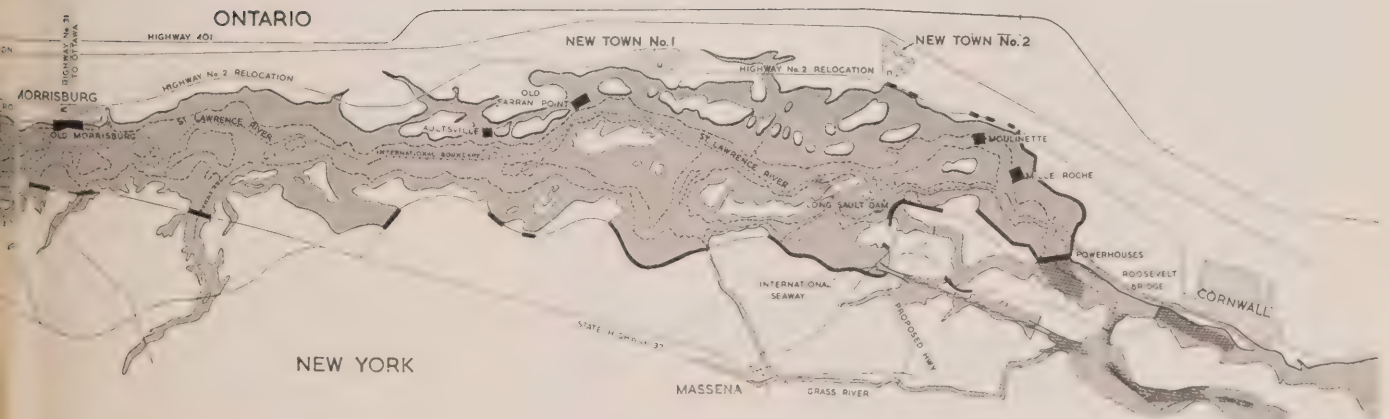
MAP of the St. Lawrence Power Project area, illustrates the extent of flooding when the development is in operation. The sites of the relocated communities, as well as the location of new highway, railway, sea-way and other facilities are also indicated.



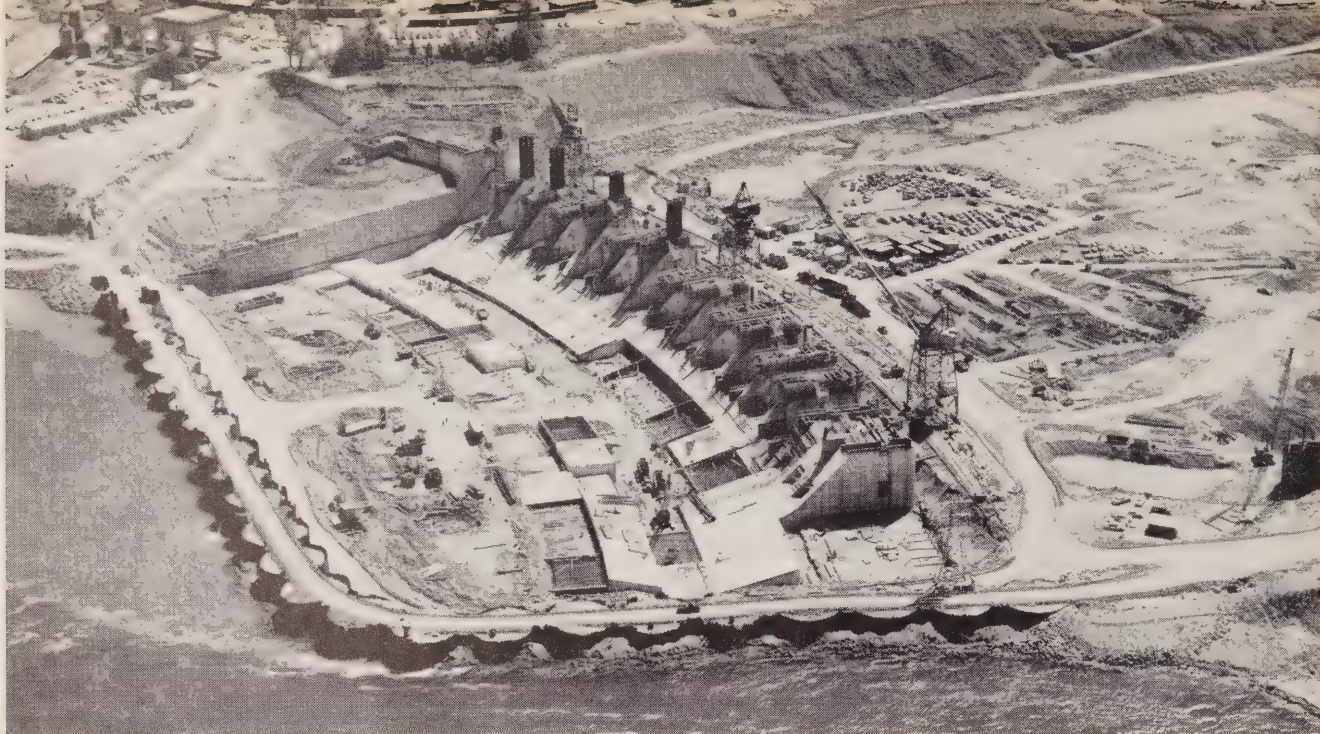




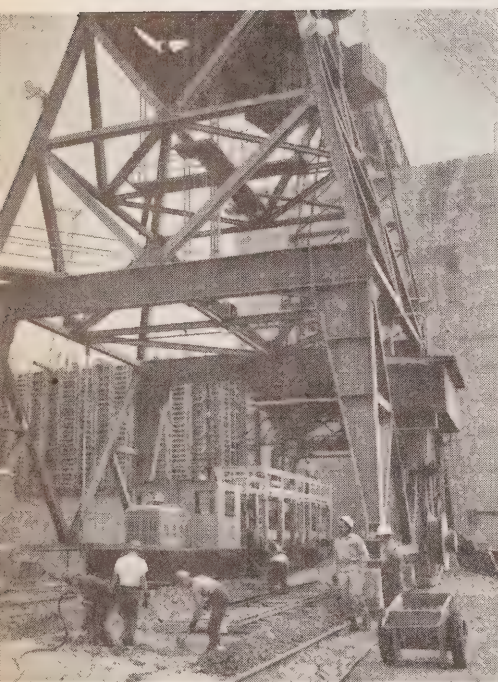
CONSTRUCTION progress is indicated in this aerial photograph of the powerhouse area, with "A" showing work underway on the adjoining powerhouses. The tunnels under the new diversion canal are pinpointed by "B," while "C" marks the canal closure structure. "D" indicates excavation for the Cornwall Canal diversion and "E" shows part of Section 3 of the Cornwall dyke.





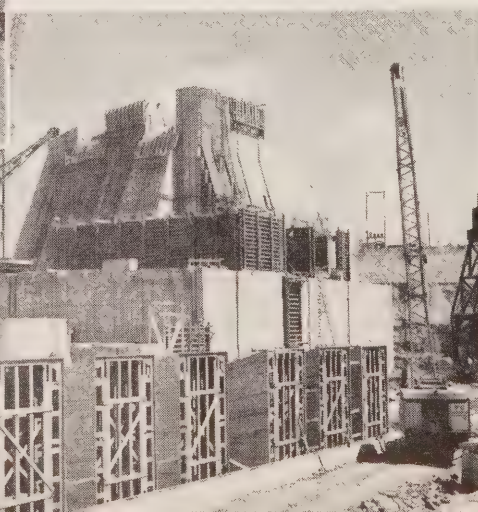


AERIAL view of Stage 1 construction for Long Sault dam. Force of the water flowing over the spillways will be dissipated by the concrete apron blocks at the "toe" of the structure.



EXPEDITING the placing of concrete at the Ontario Hydro powerhouse, this small diesel locomotive hauls two flat cars carrying large buckets from the mixing plant to this gantry crane, which lifts the buckets and dumps the concrete into wooden formwork.

CONCRETING of draft tubes for the first two of 16 generating units in Hydro's powerhouse is shown in progress. These wooden forms will be dismantled later and reassembled for the draft tubes of succeeding units.



At present, important foundation work is in progress at the north end of the Hydro powerhouse. Steel pier nosings are being placed for the discharge end of the draft tubes under the generating units. Erection of wooden forms for the first two draft tubes has enabled the placing of concrete. These forms will be dismantled later and used successively for each of the 16 units.

In the powerhouse area, toward the international boundary, all earth excavation in the river bottom has been virtually completed. This has required the removal of more than 1,500,000 cubic yards of earth. Rock excavation has been completed for 12 of the 16 generating units. Dyke construction has been proceeding at an accelerated rate this summer, with major activity in sections 2 and 3, which extend from old No. 2 highway north and west approximately two miles. In section one, stripping is in progress to take the dyke to the present Mille Roches area, where it will terminate. With fair weather conditions, some 14,000 cubic yards



of material are being placed on the dyke each day. To date, about 27 per cent of the estimated 3,500,000 yards of compacted earth fill have been put into the dyke sections.

The contractor building the Cornwall Canal closure structure is making rapid progress with that phase so that the canal will be ready for the 1957 navigation season. At the closure structure for this new canal, a total of about 65,000 cubic yards of concrete has been placed in the wing walls and the centre block. The contractor also is progressing with excavation work in the west end section of the canal toward Lock 20. The new access tunnels under the diversion canal were completed and put into service in July this year (see Page 1.). This gives a direct route to the powerhouse work area from old No. 2 highway.

Railway relocation work was resumed early this summer. All three contractors have been busy on grading operations. Track-laying and ballasting on the C.N.R. double track are proceeding rapidly from both ends of the 40-mile diversion. A total of approximately 36 miles of single track already has been laid (See Page 18).

In other sections of the project, channel improvement work is progressing favorably. Excavation is being carried out by the contractor at Galop Island, and about five million cubic yards of rock and earth have been removed. Near Chimney Island, four dredges are working on channel excavation work.

At the new St. Lawrence Transformer Station, work on the 115,000-volt system has been completed. This station has taken over the entire load from the former Cornwall Transformer Station on old No. 2 Highway. Work is continuing on the St. Lawrence Transformer Station to enlarge it in preparation for handling 230,000-volt circuits from the Robert H. Saunders-St. Lawrence Generating Station in 1958.

House-moving operations at Iroquois have been essentially completed. Work is being concentrated on the shopping centre, schools, and churches for the new village. House-moving operations to make way for the new shopping area in Morrisburg have been finished.

#### Permanent Roads

In New Town No. 2, house-moving operations are in full swing. Homes are being transported from the adjacent villages to be flooded to the new town site, and some 20 homes already have been moved. House-moving will start at an early

date in New Town No. 1. Construction of permanent roads, sewers, and watermains has been completed in New Town No. 2, and is progressing in New Town No. 1.

With the project nearing its midpoint, the work force on the Canadian side has now reached a total of approximately 4,100 persons and is nearly at the peak employment stage. Despite some setbacks this spring from the weather and other conditions, the work tempo has increased to such a degree this summer that nearly all phases of project work are on schedule.

—by C. G. W. MacIntosh.

## 60 CYCLE CHANGEOVER IN THE NORTH

**P**LANS for 60-cycle standardization, affecting domestic and commercial customers in northern Ontario who are now served by the Commission's system at 25 cycles, were announced on September 7 by Ontario Hydro. The areas to be changed over include Porcupine, Kirkland Lake, Matheson, Elk Lake-Matachewan, and smaller communities surrounding the City of Sudbury. (Sudbury itself is served from the 60-cycle system.)

The first stage of the changeover program will be launched this fall, when Ontario Hydro representatives will begin surveys of the 25-cycle areas. It is expected that the detailed surveys of domestic and commercial premises and the ordering of the necessary materials will require approximately 18 months, enabling the first cut-over to 60 cycles to be made in the spring of 1958. According to present indications, the northern Ontario conversion program will be completed before the end of the large-scale standardization program in southern Ontario.

More specific details on the new undertaking will be forthcoming in the near future, based on the early findings of the survey beginning this fall.

# NEW STEEL ROAD

**T**RACK-LAYING and ballasting work is progressing rapidly in the building of 40 miles of new double track for the Canadian National Railway from Cardinal to Cornwall to replace the existing line, which will be affected by the St. Lawrence Power Project. All track and ballasting in this relocated section of the important Toronto-Montreal line are scheduled for completion by November 30. Final work will be finished by the early spring of 1957, it is anticipated.

Modern equipment, which takes most of the heavy labor out of track-laying, is being used by the work forces of the contractor, Mannix Limited, of Calgary, Alberta, to speed the work. These new machines place the track, drive the spikes, grind the joints and tamp the ballast.

Laying of the track and ballast is a big operation, and to lay all the main line track and other tracks, it is estimated that a total of approximately 19,300 tons of steel rails will be required. More than 18,300 tons of this amount will be for 132 lb. main line track, and nearly 1,000 tons for 100 lb. spur line and passing track.

Fastening the steel rails to the quarter-million wooden ties on this section of roadbed will require more than half a million tie-plates and over a million spikes. About 275,000 cubic yards (365,000 tons) of ballast will be placed on the tracks this year.

By the late spring of next year, trains will be routed over this new ribbon of steel, carrying passengers and freight to the numerous communities along one of Canada's busiest rail arteries. ■







THIS railway cross-over section is being prepared for installation at a C.N.R.-C.P.R. junction point along the new C.N.R. right-of-way.



THIS photograph shows the unloading of a shipment of rails to be used on the 40-mile section of line between Cardinal and Cornwall.



A RAILWAY crane is placing a 132-lb. steel rail on the ties as workmen guide it into position along the double-track line.



BYPASSING the area to be affected by the raised water level of the St. Lawrence Power Project, the relocated C.N.R. line is scheduled for service next year.

# POWER FOR PIPES

Page-Hersey Tubes Ltd. at Welland is one of

Ontario Hydro's major direct industrial customers

**B**ACK in 1909, a seven-year-old pipe-manufacturing firm established a new plant at Welland, Ontario.

Attracted by the prospect of a ready supply of comparatively low-cost power from new hydro-electric plants at nearby Niagara Falls, the infant Canadian company, Page-Hersey Tubes Ltd., started operations with a total of 44 electric motors driving its pipe-production machines.

Since then, the company has grown, being regarded today as the nation's largest steel pipe and tube producer. Its steadily increasing requirements for electric power have made it one of Hydro's major direct industrial customers in the Niagara Region. Where in 1909 it needed only 44 motors, with a total rating of 934 horsepower, Page-Hersey's present production of a diversified line of pipe and tubing requires more than 2,100 motors, with a total rating of more than 29,000 hp.

Pipe is made at the Welland mills using three basically different processes, and electricity has a key role in all three. In two of the processes, flat pieces of steel skelp are formed into a tube and then joined at the seam, in one case using what is known as an electric-resistance weld. The second process is called continuous weld. The third process is used in the fabrication of what is known as seamless pipe. This method entails punching a hole down the centre of a billet or block

of steel, and then stretching the resulting "bottle" into a pipe much as a glass blower elongates a glass tube.

The electric-resistance weld process is employed for the largest sizes of pipe made by the company — up to 16 inches in outside diameter — which are also regarded as the largest produced in Canada today. Most of this electric-weld pipe finds its way into the fast-growing number of oil and gas transmission lines, which have spread across the country in the wake of the western oil and gas boom.

## Welding Electrically

The Page-Hersey electric-weld mill involves a minor miracle of technological efficiency, in which power is the basic ingredient. Starting at one end of the long mill as a huge roll of flat steel, the pipe is carefully formed into its final shape — in lengths up to 53 feet — by a series of big power-driven machines. At the heart of the process is the electric-resistance welder itself. This one machine alone requires a 3,000-hp. motor driving a 96-cycle alternator.

Basically, here is what happens on this 16-inch mill-assembly line. As the coiled steel skelp is unrolled, heavy graduated rollers, bearing down against the centre of the sheet and against its side, slowly form it into a tube. By the time it reaches the electric-welding machine it is complete but for the open seam.

At the electric welder, side rolls

again apply pressure to the pipe to close the seam, while electrodes above deliver heavy current across the two edges. The resistance of the metal at the joint causes intense heat, and the metal fuses to produce a metallic bond or weld as strong and permanent as the metal of the pipe itself. A fairly advanced process, the electric-weld method, as applied to the manufacture of large-diameter, high test steel pipe, was introduced into Canada by Page-Hersey in 1949, and the company began turning out the big 16-inch pipes early in 1950.

There are 90 motors, ranging from 1 to 30 hp. on the 16-inch pipe mill assembly line, and these must all be running at a uniform speed when the pipe is being produced. Some of the larger of these motors operate a huge cold-expanding machine in which water pressure of sufficient force is applied to the inside of the pipe so that it will actually expand to the required outside dimensions. This process also provides a severe test of the pipe's quality.

The electric-weld process is also used for the manufacture of smaller sizes of tubing, which is sold for a variety of purposes, including bicycle and furniture parts, as well as television antennae. Page-Hersey is, in fact, the only major producer of hot-dipped galvanized television antenna tubing in Canada. The chances are that many of the TV aerials rising above the roofs of homes in





△ THESE massive rolls of steel skelp at the Welland Mills of Page-Hersey Tubes Ltd. are used in the manufacture of the largest steel pipe made in Canada today.

WITH the aid of an electronic control, an operator in the seamless pipe mill withdraws a white-hot steel block or billet from one of the large furnaces at Welland.



Ontario and other parts of Canada have been assembled from steel tubing made at Welland.

A substantial portion of the Page-Hersey production entails the manufacture of small piping for plumbing and heating applications, and most of this is made by employing the continuous-weld process. This method differs from the electric-weld in that the steel skelp is brought to a white heat before being formed into pipe, and is then pressure-fused at the seam. The production schedules in the continuous-weld mills are dependent on 32 electric motors, and the failure of any one of these would immediately halt production in the entire mill. Hence close attention

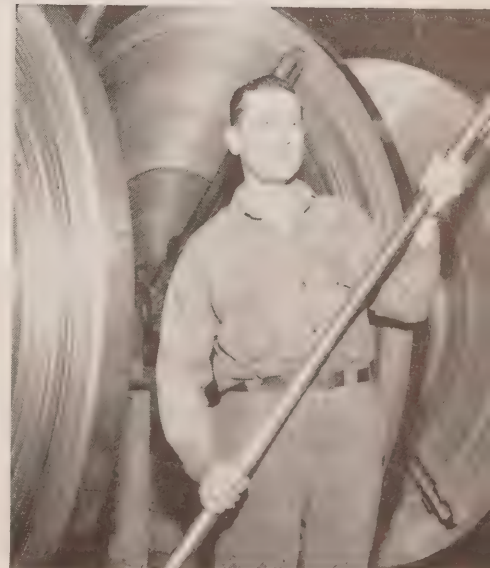
must be given to a continuous and unfailing supply of power, and the maintenance of motors in the best possible working order.

#### Seamless Method

The seamless pipe made at Welland, in sizes up to 7 inches in outside diameter, is used for nearly all piping purposes, but is particularly adaptable to high-pressure and high temperature requirements. Seamless tubing, for instance, was used in several phases of construction at

*(Continued on page 22)*

THIS company produces a substantial portion of Canada's hot dipped galvanized television antenna tubing. The rolls of flat steel in this photo are used in the process.



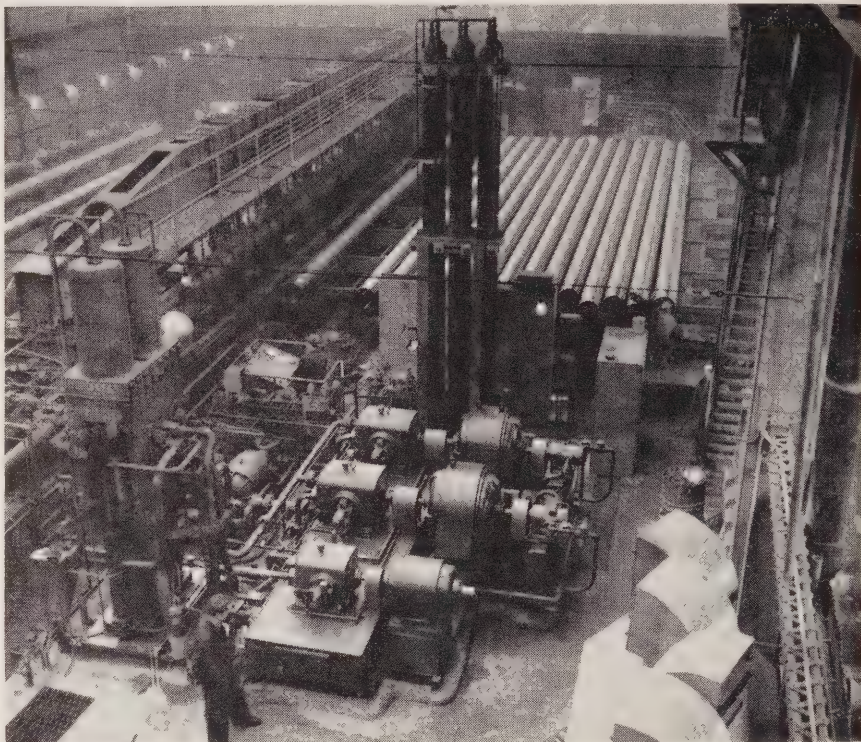




RAILWAY cars loaded with steel pipes are ready to head out of the Page-Hersey yard for western Canada where they will be used in building of an oil transmission line.



THESE 16-inch pipes are ready to enter the expander (left), operated by the large electric motors (foreground), where water pressure will expand the pipes to the required diameter, as well as provide a test of their quality.



Ontario Hydro's Richard L. Hearn and J. Clark Keith thermal-electric stations at Toronto and Windsor respectively.

Power is again the workhorse in seamless pipe manufacture. Converting a short solid block of steel into a thin-walled piece of pipe, ranging from 20 to 100 feet in length, involves the use of 37 big motors with a total capacity of some 4,800 hp.

Not all the motors at the Page-Hersey mills are at work on the actual production of pipe. Many more are used for processing the pipe after it is made: in threading, straightening, testing, and coating the pipe for shipment. Many motors are also carried as spares, being used only when the main driving motors are being overhauled or repaired.

Pipe-making also requires a variety of electrical frequencies, so that while a major part of the electrical equipment at the Welland mills is being converted for use at 60 cycles under Hydro's current frequency standardization program, special mill equipment will continue to operate

at a variety of frequencies ranging from 25 to 960 cycles.

In business since 1902, Page-Hersey has kept in step with Canada's steadily expanding economy. At the outset this all-Canadian company had approximately 125 employees and a total capitalization of about \$88,000. Today more than 1,500 people are employed by the firm, and assets total more than \$34 million.

The building of Canada's first "lapweld" process pipe mill at Welland in 1909 was the beginning of a long series of "firsts" for the company in Canadian pipemaking, culminating recently in the announcement by Page-Hersey and The Steel Company of Canada that they would jointly build the country's first "Big-Inch" pipe mill at Welland, capable of producing pipe

from 20 to 36 inches in outside diameter.

Meantime Page-Hersey itself is in the midst of a multi-million dollar expansion program for its present pipe mills, a project geared to meet not only the anticipated demands of Canada's rapidly expanding oil and gas industries, but to take care of the multifarious pipe needs, which are a natural outgrowth of the country's continuing development in all areas of industry and commerce.

This, in turn, will bring a greater demand for power from Ontario Hydro for the new "Big-Inch" pipe mill and for the company's current expansion program. Thus, at every turn, power is going "hand-in-hand" with the progress of Canada's oldest and largest pipe manufacturing firm.



## IN ALL HUMILITY

(Continued from page 11)

J.G. Baldwin, Vice-President, O.M. E.A.

In recalling the noteworthy career of Sir Adam, Mr. Griesinger said the achievements of Hydro's first chairman were reflected in the province's present flourishing position.

"I am confident no province in Canada, nor any country in the world in fact, is growing as rapidly as we are," he stated.

During his tribute to Sir Adam, who died on August 15, 1925, after 19 years as Chairman of the Commission, the speaker emphasized that the memorial ceremony — as exemplified in the familiar quotation: "To live in hearts we leave behind, is not to die," — gave assurance that Beck's accomplishments would not soon be forgotten.

Concluding the memorial ceremony, dedicatory prayers were offered by the Rt. Rev. G. B. Snell, Suffragan Bishop of Toronto.

Welcoming guests at the luncheon which followed the service, Mr. Merson said this tribute from District 4 O.M.E.A., comprising 34 cost-contract municipalities, provided an opportunity for reviewing the progress of the past half-century.

"It is my sincere hope, too, that men, 50 years from now, will be able to say that we did a good job too," he said.

Mr. Merson stated that offers of help to the Toronto Hydro-Electric System, in a recent storm emergency, from Ontario Hydro and associated municipal electrical systems as far distant as St. Catharines, were reassuring evidence that Hydro was still a strong co-operative enterprise.

As guest speaker, John Collingwood Reade, noted Toronto radio commentator and writer, described Hydro as the "very essence of democracy."

Dealing with the impact of elec-

## NEW LINE LINKS GOGAMA



KEY figures at the Gogama ceremony were H. R. Graham, Manager of Hydro's Northeastern Region (left) and Rheal Belisle, M.P.P.

**G**OGAMA, a new "jumping-off" spot for mining and development work in northeastern Ontario, stepped briskly into a new era a few weeks ago when Hydro service was inaugurated in the community.

A large assembly of Gogama residents applauded enthusiastically as Rheal Belisle, M.P.P. (Nickel Belt), closed the switch to officially place a new distribution line in service. Representing Ontario Hydro was H. R. Graham, Manager, Northeastern Region, who congratulated Gogama citizens on their enterprise. He also paid tribute to the Gogama Board of Trade and Albert Giroux, Chairman of its Hydro committee, which handled the negotiations for Hydro service. Representing Sud-

bury was Gerald J. Monaghan, M.P.P. (Sudbury).

Power is being supplied to the northern hamlet, which is situated on the C.N.R. main transcontinental line 90 miles northwest of Sudbury, from Shining Tree Transformer Station, utilizing approximately 16 miles of an existing circuit and approximately 13 miles of new line. The new line and associated facilities will supply 106 domestic customers, 22 commercial (including the local station of the Ontario Department of Lands and Forests) and two power customers.

For many years a "coal-and-water" stop for C.N.R. trains traveling between Capreol and Foleyet, and accessible only by train or plane, Gogama was linked with outside communities in 1953. In that year the Ontario Department of Mines completed the Sinclair Highway — a 41-mile access road joining with the Westree Road.

Located in the centre of a large forest area, Gogama is an important logging and lumbering base as well as a fur-trading centre. With adequate highway and Hydro facilities now available, Gogama residents are looking to the possibility of developing a thriving tourist trade in the future.

Officiating at the ceremony, Mr. Belisle stated that it marked "the culmination of a long series of plans, efforts and hopes," while Mr. Giroux said the community would no longer be dependent on privately-owned generators for electrical supply. ■

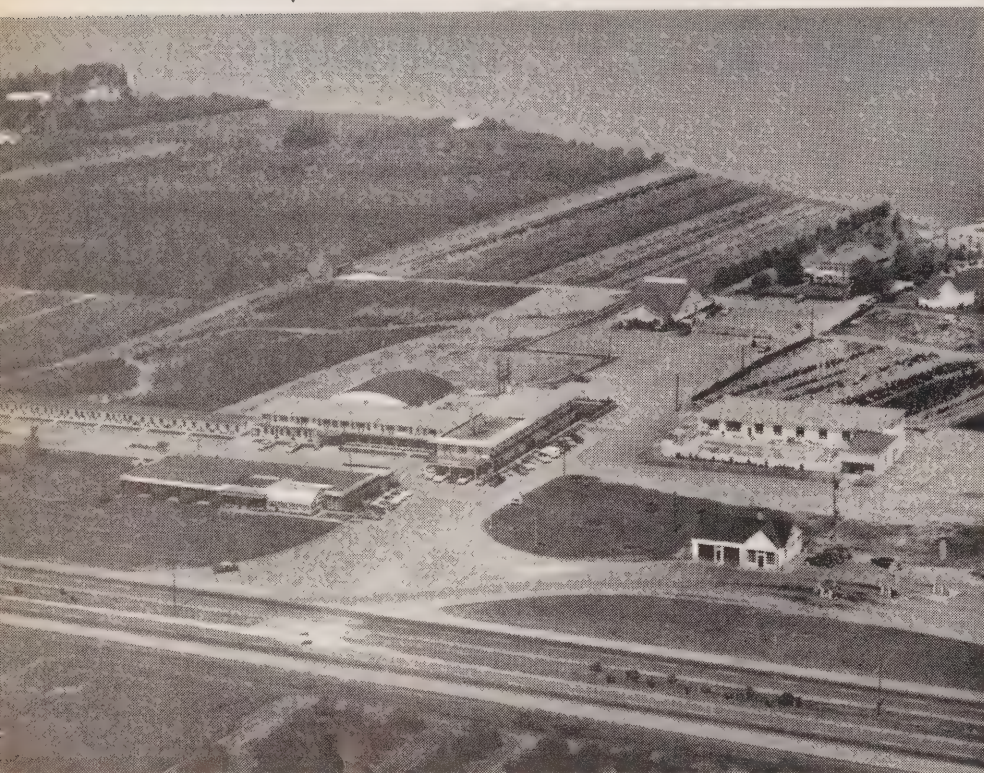
tricity on the economy of Ontario, he said, "the whole tempo or pattern of modern living is dependent on the flow of electricity."

"I have grave doubts that Ontario would have become the hulking industrial centre it is today if men had not devised methods of transmitting power."

In response to these tributes, Commissioner Kennedy told the audience that maintenance of Hydro's present position involved adherence to two outstanding precepts of Sir Adam Beck: Hydro belongs to the people, and all associated with the enterprise are servants of the people. ■



AERIAL photograph shows the ideal location of Vineland's Garden Centre enterprise between the four-lane Queen Elizabeth Way and Lake Ontario.



# The Growing Garden

**Bustling Vineland centre was a nursery farm eight years ago . . . today it's a flourishing, many-faceted enterprise**

**by Frank C. Wood**

**A**LTHOUGH their monthly bill from Ontario Hydro has increased more than one hundredfold in eight years, the proprietors of Prudhommes' Garden Centre Hotel at Vineland are not uttering a word of protest.

This jump in electrical costs — from \$8 to approximately \$900 a month — far from indicating a rise in actual rates, represents expansion and the installation of an almost

unbelievable number of new electrically-operated machines.

It all came about like this: Eight years ago this now-flourishing establishment — owned and operated by the Prudhomme brothers, John and George — was, more or less, an average Niagara Peninsula nursery farm, producing fruit and ornamental trees, as well as shrubs, for the wholesale and retail markets. Two

homes, equipped for Hydro service, and a large barn comprised the Prudhomme buildings.

In 1948, when motels were becoming popular with motorists, the Prudhommes decided that their farm, on the heavily-travelled Queen Elizabeth Highway, was an ideal site for such an enterprise. To decide was to act with the brothers Prudhomme and the con-



templated motel soon was a reality.

The new motel was well-patronized, and as a result power consumption soared. It was, of course, only a coincidence that, in the same year, the Commission augmented its power resources in southern Ontario by placing its Stewartville Generating Station in service and purchasing additional power from Polymer Corporation at Sarnia.

Power consumption rose again in 1949 when the Prudhommes built a coffee shop, and in this year the Commission started to put emergency fuel-electric units into service to meet mounting demands.

In 1951 the large barn on the 100-acre property was in need of repair. This gave the brothers the novel idea of remodelling the barn and converting it into a legitimate theatre, complete with stage, sloping

Theatre has drawn appreciative audiences from both Canada and the United States. Several productions have been based on top-ranking Broadway and London presentations.

Shortly after constructing the theatre, the Prudhommes added a second floor over the coffee shop to provide additional guest rooms. Naturally this entailed increased power distribution to this growing Vineland enterprise, and in 1951 the Commission officially opened its Richard L. Hearn and J. Clark Keith Generating Stations at Toronto and Windsor respectively to provide for the growing electrical needs of the Prudhomme brothers and thousands of other customers.

#### Remodel Farmhouse

Progress continued in 1952 when the big farmhouse on the Garden Centre property was remodelled and

Further progress was made in 1954 when the motel section to the west of the main hotel, constructed in 1951, was added. This brought the number of rooms to 80 and the total guest capacity to approximately 150. At nearby Queenston the Commission placed seven units of the Sir Adam Beck-Niagara Generating Station No. 2 in service that year to meet the ever-increasing demands of power-hungry customers.

#### Recreation Centre

Still forging ahead last year the Prudhomme brothers constructed a new ballroom and lounge, enlarged the coffee shop and added a second storey on the west wing of the hotel. They also built a recreation centre, comprising eight bowling alleys, snack bar, outdoor swimming pool, billiard room and rooms for archery and shuffleboard. This summer a

FOUNDATION of the flourishing business, the greenhouse is still an important Garden Centre building. John Prudhomme (left) and Arnold Jaunberg examine a plant.



AN IMPORTANT nerve-centre is the large kitchen, where, with the aid of such electrical appliances as stoves, meat saws, slicers and food-mixers, meals are prepared for the dining-room and hotel coffee shop.



floor, balcony and a snack bar in the basement. With the installation of heating and air conditioning equipment, 450 patrons were able to enjoy the dramatic presentations in comfort under any weather conditions. The theatre venture has proved successful. With professional actors and actresses playing the leading roles, the Garden Centre

enlarged into a 16-room annex to the main hotel. In that year the Commission placed in service the first units of the Otto Holden Generating Station on the Ottawa River.

There was no abatement of activity during 1953 when the garden terrace dining room, seating 225 people, and two banquet rooms on the main floor were completed.

barn was remodelled to stable riding horses, to provide further entertainment for their guests. The stables are, of course, electrically lighted.

It is understandable that, with these continually increasing amenities at the Garden Centre, it was necessary to convert 128 items of 25-  
*(Continued on page 26)*



cycle equipment for operation at 60 cycles when frequency standardization operations were undertaken there earlier this year.

With the higher frequency available, the Centre will now be able to acquire even more modern equipment, some of which is designed for operation only at 60 cycles.

This outstanding Canadian enterprise has become a famous centre for conventions, which are attended by thousands of delegates. In addition to attracting numerous well-known Canadian organizations, it draws conventions from the United States such as those of the International Affiliation of Ad and Sales Clubs, the International Association of Barbershop Quartettes, and the International Lion's Club. Such conventions constitute a valuable addition to Canadian "exports."

Plans for the immediate future include a scheme to enclose the

Prudhomme, one of the partners in this ambitious development, believes that the only other lighted Canadian course is located at Windsor.

Long-range plans for the Centre include a harbor of steelpiling construction on Lake Ontario. A definite date has not been set for this project, but already the Prudhomme partners envisage the day when scores of yachts and other craft are anchored snugly in the friendly shelter of this new port.

Even in this nautical venture Hydro will play a part, for at the extremity of the harbor, lights will be installed to guide navigation. A series of outlets along the new docks will provide electrical service to the yachts and boats moored there, while pipes laid in the reinforced concrete wharves will furnish filtered water for the visiting craft.

To provide for this and the generally rising power demand through-

## OPEN HOUSE

*(Continued from page 9)*

Responding to the tributes to Ontario Hydro, Commissioner Kennedy warned his audience that "we must not forget the future" in observing Hydro's Golden Jubilee. The Commission, he continued, was an organization which, from an administrative standpoint, upheld three admirable principles. While recognizing that it must serve its customers in a manner which they have a right to expect, Ontario Hydro was also aware that it must possess administrative convenience and that it must be sufficiently flexible to keep pace with the requirements of changing times.

Mentioning the fact that the hydraulic sites in the province had been developed to the point where other sources of generation must be employed, Mr. Kennedy said the Commission must be prepared to expand its total resources to some 23.6 million kilowatts by 1980. The entire Hydro system, including the municipalities, must be prepared to meet unprecedented expansion of facilities.

### Equal to Tasks Ahead

Expressing the confidence that the men associated with the Ontario and municipal commissions were equal to the responsibility that lay ahead, the speaker said "when the Hydro organization celebrates its first century of progress, I am certain that a great many names will be added to our proud history."

Concluding the ceremonies, Mr. Laurie congratulated members of the Western Region staff, including Gordon M. McHenry, Consumer Service Engineer, and John I. Chute, Consumer Service Supervisor, on their arrangements for the "open house." He also presented Commissioner Kennedy with a Hydro Golden Jubilee puzzle in the form of a sealed electric bulb, mounted on a wooden base, and bearing in the crystal enclosure two of the now-famous Jubilee seals. ■

IT IS difficult to realize that the Garden Centre Theatre was a barn before it was remodelled in 1951. Now used for summer presentations, the theatre can accommodate some 450 patrons.



swimming pool which will be heated for year-round operation. An entirely new venture of laying out a par-three golf course, similar to a 9-hole golf course but a little smaller, has been virtually completed, with sodding and landscaping in progress at present. Hydro will co-operate in this new project in 1957, for the 9-acre course will be floodlighted. John

out the province, the Commission is planning, among other projects, such as the St. Lawrence and the installation of three additional units (each 200,000 kw.) at its Richard L. Hearn Generating Station in Toronto, the completion of its Sir Adam Beck G.S. No. 2 and the pumped-storage phase of this Niagara development.



# ALONG HYDRO LINES



## Windsor Starts New Service Building

Reflecting continuing expansion at Windsor, the Windsor Utilities Commission recently approved construction of a new \$623,000 service building for the utility's Hydro division. The new, two-storey structure, to be located adjacent to a local substation, will provide storage and garage facilities for all Hydro division vehicles and supplies. In addition, offices for the operational employees of the division will be moved to the new building. The Windsor Commission completed a three-storey head office in the heart of the city last December. Official opening ceremonies were held in May this year. (*Ontario Hydro News*—June, 1956).

## Frequency Standardization Completed at Welland

Hydro's frequency standardization operations were completed recently at Welland with the last of 55 separate "cutovers." During the operation, which involved 5,426 electrical customers, a total of 29,556 frequency-sensitive items of equipment were altered for 60-cycle operation.

## P.U.C. Sets New Tenant Deposit

Since June 1, all tenants applying to the Tavistock P.U.C. for Hydro services have been required to make a deposit of \$20. This decision was reached after a discussion by the local commission, during which it was revealed that the number of "transient" tenants in Tavistock was increasing.

## St. Marys Initiates Lighting Program

St. Marys Public Utilities Commission has received the "go-ahead" signal from the local town council for the installation of new fluorescent street lights on the municipality's main thoroughfare. The installation of 30 new lighting units is being undertaken in conjunction with the construction of new sidewalks in the same area.

## Vice-Chairman Named To New Cabinet Post

Hon. W. K. Warrender, Hydro Vice-Chairman and Minister without Portfolio in the Ontario Government, has been named acting Minister of Municipal Affairs by Prime Minister Leslie M. Frost. Mr. Warrender succeeds Hon. W. A. Goodfellow, who has assumed the post of Minister of Agriculture.



## PENSION PLANS

CONSTANTLY alert to the importance of maintaining the flexibility of The Municipal Hydro-Electric Pension and Insurance Plan, directors are shown during an August conference. Discussing proposals designed to meet changing economic conditions, left to right, are: Douglas J. Gordon, Municipal Service Engineer, Ontario Hydro; B. C. Howard, Assistant Solicitor, Ontario Hydro; Henry G. Devitt, F.S.A., Toronto, Actuarial Consultant; G. R. Davis, General Manager, Kingston P.U.C., Director; R. S. Reynolds, General Manager, Chatham P.U.C., Vice-Chairman; Chairman Percy R. Locke, Commissioner, St. Thomas P.U.C.; Harry G. Menzies, Deputy Solicitor, Ontario Hydro; Bert Merson, Chairman, Toronto Hydro, and Secretary-Treasurer of the Plan; Miss Norma Corbett, Toronto Hydro, Assistant Secretary, and Miss Olive Weir, who recorded the session.

### **G. D. Floyd Named Fellow of A.I.E.E.**

George D. Floyd, the Commission's Assistant General Manager-Engineering, has been named a Fellow of the American Institute of Electrical Engineers. In announcing Mr. Floyd's election, the board of directors stated that the honor was conferred "for his planning and direction of the technical growth of a large electric utility system."

Associated with Ontario Hydro since 1919, Mr. Floyd has served in various capacities with Ontario Hydro, including Director of the Planning Division, Deputy Assistant General Manager-Engineering and his present post to which he was appointed in 1955.

### **Merritton Purchases Dual Building**

Merritton Hydro-Electric Commission has approved the purchase of a new steel building with accessory equipment from a Guelph firm. The new structure, to be located on a local substation property, will serve as a dual garage and warehouse for field equipment.

### **Fort William Pushes New Lighting Program**

Fort William Hydro-Electric Commission is engaged on the installation of new streetlighting units along city thoroughfares. Announcing the program recently, Mayor Hubert Badanai said it was anticipated that 7½ miles will be completed this year. The present program also makes provision for completion of 7½ miles in each of the next three years. Last year the local commission rebuilt an equal amount, involving the installation of 212 modern units and the results, according to Mayor Badanai, were "very satisfactory." In addition 48 new units were installed in new building subdivisions. At the end of 1955, the local utility's investment in streetlighting facilities amounted to \$225,508.



## **FLORAL SALUTE**

**L**ONDON has said it with flowers — 16,000 of them — to let people know that this is Hydro's Golden Jubilee year.

This floral salute in the city's Victoria Park features three types of plants laid out in a monster bed — 60 feet by 20 feet. The words "Hydro Jubilee" and the numerals "1906" and "1956" are formed by white santolina. Alternanthera provides a colorful background in a variety of tasteful shades, including yellow, bright red, bronze, gold and dark red. In each corner of the bed, quarter circles are formed by pink begonias.

Conical-shaped boxwood trees in each corner and in the centre of the bed complement the floral display, adding interest to the general design.

While the huge bed is similar to a plan in general use in parks and on Ontario Hydro property across the province, it differs in the fact that the word "London" is omitted. London's Park Superintendent, W. E. Foster, said this is the 36th year that there has been a floral display in the park, a new design being used each year.

### **Engineering Manpower Conference**

Dr. Richard L. Hearn, Chairman of Ontario Hydro, served on the General Advisory Committee of the National Engineering Manpower Conference held at St. Andrew's-by-the-Sea, N.B., September 9-10-11 this year.

The 13-man committee, consisting of leading Canadian industrialists and scientists, has held several meetings to plan the three-day conference, attended by approximately 75 persons — leaders in education,

government, professional societies, labor and industry.

When plans for the National Engineering conference were announced, it was hailed by business spokesmen as "one of the first great moves toward increasing the supply of engineers in Canada." Primarily the conference, with James S. Duncan, Toronto industrialist, as Chairman, analysed and assessed the supply and demand of professional engineers and technical personnel for a definite move to defeat shortages which threaten the long range development of Canada's economy and defence.



# This and That

## September's Here Again

September reminds us that the Ontario countryside will soon burst forth in a riot of autumn colors, which constitute one of nature's most amazing and beautiful spectacles. The Muskoka District will hold its 6th annual Cavalcade of Autumn Foliage during the week-end of September 22-23.

## September's Origin

And now for a brief look at the origin of the name September. As the name comes from "septem" (Latin for seven), it must sometimes puzzle modern readers to realize that this name belongs to the ninth month of the year. The Book of Knowledge explains that September was, in fact, the seventh month in the old Roman calendar.

## For the Calendar Pad

A few more dates to add to the dwindling calendar pad:

Western Section, A.M.E.U. Accounting and Office Administration Conference, Prince Edward Hotel, Windsor, Sept. 20-21; Annual meeting Thunder Bay M.E.A., Prince Arthur Hotel, Port Arthur, Sept. 27 and 28; Annual meeting, District 6 O.M.E.A., Waterloo, October 3, and Annual meeting, District 8, O.M.E.A., Guildwood Inn, Sarnia, October 12.

## "A Debatable Point"

OBSERVANCE of Hydro's Golden Jubilee this year recalls the struggle to establish a publicly-owned power system in Ontario, as well as the determined efforts necessary to persuade the average householder to "take" electricity into his home. It's interesting to realize that Ontario was not unique in the latter respect.

An article in a recent issue of "*Load*," published by the General Electric Company at Schenectady, N.Y., contains several excerpts from a brochure: "*The Electrical Solicitors' Handbook*" issued by the National Electric Light Association in 1909. The purpose of the handbook was to overcome the prejudices and mistaken ideas about the use of electrical energy.

Dealing with methods of economizing on lighting costs, the handbook contained the amusing bit of advice that "the lighting of servants' bedrooms is a debatable point as it encourages reading there and consequent long-hour burning. Servants are apt to learn

a little electrical engineering, just sufficient to change the low for high-candlepower lamps from other parts of the house. Still the fire risk is greatly reduced if electric light is installed in these rooms, and therefore it may be wise to do so on this account. In some houses the lamps in servants' bedrooms are so wired that they can be controlled by a switch in the dressing room or similar place and the consumer can extinguish their lamps when he goes to bed himself."

## Successful Campaign

Our congratulations to the President and members of Ontario Hydro Branch No. 277 of the Canadian Legion on the successful culmination of their campaign to enlist the support of the Dominion Command of the Canadian Legion for the Canadian Olympic Training Plan. The plan, which was originated by the late Robert H. Saunders, former Hydro Chairman, when he was Chairman of the Canadian National Exhibition Sports Committee, brings Olympic "hopefuls" to Toronto from all parts of Canada during the two-week run of the C.N.E. Here entrants and coaches can compete in trial events and receive special training. Operating on an annual budget of \$20,000, the "COTP" received a \$2,500 contribution from the Ontario Hydro Branch last year.

Carrying their support of the scheme still farther this year, the Hydro Branch sent President E. N. Hallman to the Canadian Legion's 16th Dominion Command convention at Vancouver where he was successful in receiving approval of his appeal for Legion support on the national level. This year the project brought 10 athletes from each of the four western provinces, as well as from Nova Scotia; two from Prince Edward Island; 50 from Quebec and a large number from Ontario to Toronto in August.

## "At the Sound of the Gong"

Addressing the annual social studies conference of the Federation of Women Teachers' Associations of Ontario in Toronto recently, G. M. Grant, Vice-President of The Bell Telephone Company of Canada, told delegates that a musical tone will soon replace the present familiar ring of a telephone bell.

According to the telephone executive, the key to the new telephone ring is the transistor tube—a tiny electronic brain-child that is replacing the more conventional tubes in the electrical field.

# JUBILEE MOTIF



**E**FFECTIVE use has been made of two foliage plants — alternanthera and santolina — to provide the pattern for the Commission's floral clock at Queenston during the Jubilee year. Approximately 17,000 plants, all cultivated in the Commission's greenhouse, are employed in this horticultural "mosaic." Various colors of alternanthera, a plant originating in the tropics, are ingeniously combined with the gray of the indigenous santolina.

The outer circle of the clock dial, which is 38 feet in diameter, has a base of yellow alternanthera, with the minute markings in red and the 5-minute marking triangles in gray santolina. Red alternanthera provide the carpet for the next circle and are bordered with santolina. In the band of red alternanthera the letters spelling the words "Ontario Hydro" are formed with santolina and yellow alternanthera respectively. The base for the inner circle is of yellow alternanthera, while the figures "1906-1956" are in contrasting pink alternanthera.





ONTARIO HYDRO  
NEWS

OCTOBER

1956



"NPD" SOD TURNING

# ONTARIO HYDRO

PUBLISHED BY THE HYDRO-ELECTRIC  
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OCTOBER, 1956

VOLUME 43, NUMBER 10

## AN IMPORTANT YEAR

SEVERAL events in recent months have invested Hydro's Golden Jubilee year with special significance. The month of September just passed, for example, witnessed the turning of the first sod for Canada's pioneer nuclear-electric station (see page 2).

Participating in this project with Atomic Energy of Canada Limited and the Canadian General Electric Company Ltd., Ontario Hydro is confident that "NPD" (Nuclear Power Demonstration) is destined for an effective role in harnessing the energy of the atom for peaceful purposes. Although of comparatively modest capacity (20,000 kilowatts), the station will permit Canada's engineers and physicists to continue design studies leading to the construction of larger nuclear-electric plants (as outlined in the article "How 'NPD' Will Function" — page 5).

The sod-turning ceremony in September and other events guarantee for 1956 an outstanding place in Hydro annals. Of particular interest, of course, was the recent announcement by Hon. Leslie M. Frost, Ontario's Prime Minister, of an interconnection between the Commission's Northwestern Division system and the connected networks of The Manitoba Hydro-Electric Board and the City of Winnipeg Hydro-Electric System. This interconnection will be of mutual advantage as it will permit more efficient use of the combined generating resources of both systems.

Noteworthy, too, was the Commission's announcement that frequency standardization operations would be inaugurated in Northeastern Ontario. Within the next few years, the present 25-cycle system serving domestic and commercial customers in several northern communities will gradually be changed over to the 60-cycle frequency. Scheduled for completion in 1958, this project is of inestimable importance in the complete integration of Hydro's electrical networks on a province-wide scale.

Equally important was the decision to further increase the capacity of the Richard L. Hearn Generating Station in Toronto—already Canada's largest thermal-electric plant—to one million kilowatts.

Taken singly, perhaps any one of these events would have been sufficient to set 1956 apart. In their entirety, they represent the culmination of many months of careful consideration and planning, and rank as decisions that will have a profound effect upon the future economy and well-being of this province.

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## COVER SHOTS

OUR FRONT cover this month, shows Hon. Leslie M. Frost, Prime Minister of Ontario (left) and Rt. Hon. C. D. Howe, Canada's Minister of Trade and Commerce participating in the ground-breaking ceremonies for Canada's first nuclear-electric plant.

The back cover traces the evolution of Toronto's University Avenue to its present status as one of the Queen City's most beautiful thoroughfares.





**E**NROUTE to its pre-arranged location in New Town No. 2 — a modern community being created by Ontario Hydro as part of the St. Lawrence Power Project — this home rests easily on a specially-designed highway “dolly” or trailer. Framing the transient dwelling is the huge machine (also used in the house-moving operations), which lifted the home from its original foundations on to the trailer.





ARCHITECT'S SKETCH OF THE NUCLEAR POWER DEMONSTRATION PLANT

Sod-turning ceremonies launch building  
of nuclear demonstration plant

# D A W N O

ONTARIO'S Prime Minister, Hon. L. M. Frost (left), and Rt. Hon. C. D. Howe hold the sods they turned for Canada's first nuclear-electric station. Reflecting the jubilant mood of the audience are H. M. Turner, Chairman, Canadian General Electric Company Ltd. (extreme left); W. J. Bennett, President, Atomic Energy of Canada Limited. Hydro Chairman Dr. Richard L. Hearn is on the right.

WITH a fanfare of music, Canada triumphantly entered the nuclear power age on September 19 this year.

Climaxing an hour-long ceremony on the banks of the Ottawa River, Rt. Hon. C. D. Howe, Canada's Minister of Trade and Commerce, and Hon. Leslie M. Frost, Prime Minister of Ontario, grasped chrome-plated spades to turn the sod for Canada's first nuclear-electric station.

To be known as "NPD" (Nuclear Power Demonstration) the pilot plant is being built jointly by Atomic Energy of Canada Limited, Ontario Hydro and Canadian General Electric Company Limited.

Located on a site downriver from

Ontario Hydro's 372,000-kilowatt Des Joachims Generating Station, this pioneer plant is expected to come into operation in 1959 with an electrical capacity of 20,000 kw.

## Historic Ceremony

Despite a torrential rain, a large audience witnessed the historic ceremony, held under the shelter of a large marquee. Present for the momentous occasion were representatives of the Canadian and Ontario Governments; Atomic Energy of Canada Limited; Ontario Hydro; the Canadian General Electric Company Ltd.; the O.M.E.A. and A.M.E.U.; the Toronto Board of Trade and ecclesiastical representatives.

Introducing Mr. Howe, one of the

chief figures at the ceremony, William J. Bennett, A.E.C.L., President, who presided as Chairman, described the Canadian parliamentarian as a man noted for "his incurable optimism."

During his address, Mr. Howe predicted that nuclear energy would provide an alternative source of energy "and because it can be produced in almost unlimited quantities it establishes a ceiling for future power costs."

Describing the ceremony as a "turning-point" in the Canadian atomic energy program, Mr. Howe traced the project from 1942 when a method of producing plutonium—one of the fissile materials needed for the atomic bomb—was undertaken.

With little to start with in the way of experience and trained personnel, Canada had gambled on the latent ability of its scientists and en-





△  
PRESIDENT A. J. LITTLE extended congratulations on behalf of Toronto Board of Trade party at the ceremony.



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REPRESENTATIVES of Government, business, industry and the church were seated on the ceremonial platform. Prime Minister Frost described the event as the beginning of a new chapter in Canadian history.

# A NEW ERA

gineers. "The gamble paid off, and in 1944 we began building the NRX reactor," which had proved to be a unique tool for research and experiment.

From the inception of the program at Chalk River, one of the main objectives was the development of atomic energy as a low-cost, reliable source of electric energy. Turning to the power reactor feasibility study announced in 1953, in co-operation with Ontario Hydro and certain other Canadian utilities, Mr. Howe said that the Commission's participation in the "NPD" project with Atomic Energy of Canada Limited and the Canadian General Electric Company was welcomed for many reasons.

"First, as the NPD is a demonstration reactor, it seemed essential that it be operated in a power system, which was sufficiently large to cope with interrupted operation or

operation at low load factor. Second, it seemed desirable that the first power reactor should be located within easy access of Chalk River, since the A.E.C.L. plant must provide expert advice on nuclear performance."

Under the three-way partnership, Atomic Energy would supply the nuclear specifications and pay for the cost of the reactor section of the station, less the amount being contributed by Canadian General Electric, which had agreed to be responsible for an amount up to \$2 million toward the costs of design and engineering development. Ontario Hydro would furnish the specifications for the conventional part of the plant, pay for its cost, including the site, and would operate the station, when it was completed, under an agreement with Atomic Energy.

"While the reactor is located in Ontario, both Atomic Energy of

Canada Limited and Ontario Hydro are anxious that the other utilities in Canada may be in a position to take full advantage of the information that is gained," Mr. Howe continued.

## Excellent Prospects

Expressing confidence that this basic design, pioneered in Canada, offered excellent prospects for the production of economic nuclear power, the speaker said that "NPD" represented a necessary step in the achievement of this goal.

"We believe that nuclear power must be produced at a cost not greater than six mills per kilowatt-hour if it is to be attractive for use in large central power stations in Canada."

Continuing, the Trade and Commerce Minister stated that the magnitude of the problems to be solved

*(Continued on page 4)*

AFTER the ceremony, Dr. Hearn (left) and Mr. Howe were noted discussing details of Hydro's model of a nuclear-electric plant.



MAP indicates the strategic location of "NPD" and other important Hydro generating stations on the Ottawa River.



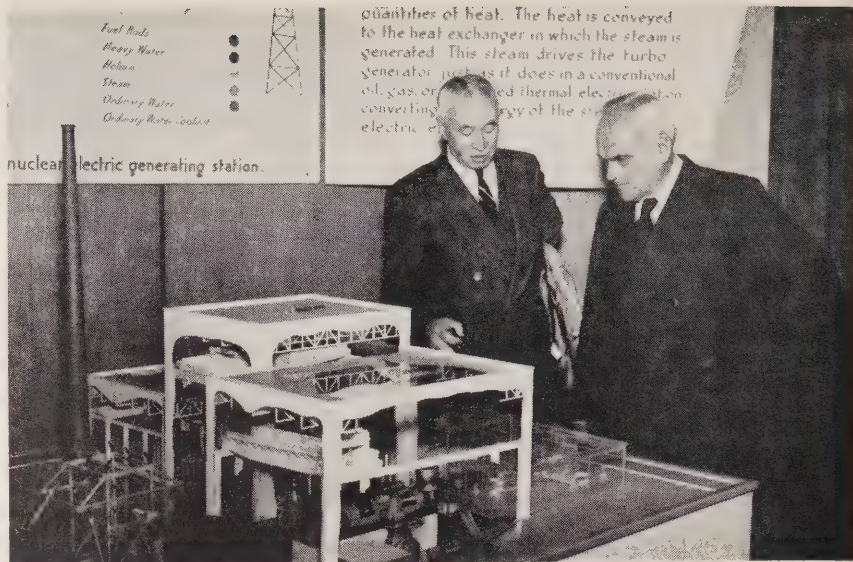
in reaching the six-mill power pointed up the importance of the preliminary design studies being carried out at Chalk River by Ontario Hydro and certain other organizations associated in these studies.

"It is too early to say what the outcome of this study will be. It is clear, however, that the future program must be based on the kind of partnership with the utilities and the manufacturers, which we have established on the 'NPD' project."

#### Natural Resources

Introducing Prime Minister Frost, the other key figure in the sod-turning ceremony, Ontario Hydro's Chairman Dr. Richard L. Hearn voiced the hope that natural gas from western Canada "may provide us with a source of fuel to operate our conventional thermal-electric stations." In addition, another natural resource from Ontario—uranium—"will, in all probability, play a large part in providing fuel for our nuclear stations of the future."

"While we may not be able to



match the cost of producing power from hydraulic sources, we can be assured that eventually we shall find a way of bringing the cost of alternative sources down to the point where they will be in keeping with the economy that has long been associated with Ontario Hydro."

Describing the ceremony as a "memorable occasion," Premier Frost said that it heralded "the start of a new era in this progressive nation of ours."

Directing attention to the St. Lawrence Power Development, Ontario's Prime Minister pointed out that "your province is investing approximately \$300 million in the country's future."

"That huge undertaking will not only feed another million and more horsepower into our power grid, but, in co-operation with the efforts of other governments, it will open up the interior of this continent to ocean shipping. Such are the requirements and such is our faith in the future."

#### "Ruthless Requirements"

But with rapid growth and "ruthless power requirements," Ontario Hydro may have to meet demands by 1980 almost five times greater

than its present resources, Mr. Frost continued.

While oil and gas produced in western Canada would make a major contribution to the power resources of central Canada and particularly Ontario, the harnessing "of the unknown potentials of nuclear energy" to produce electric energy represented a major change. Terming Canada as "one of the five great atomic powers in the world," Premier Frost voiced the confidence that this nation would strive to be among the first in America in the production of commercial power from nuclear energy.

Turning to the production of uranium in Ontario, the speaker said that provincial mines had made "enormous advances within a comparatively few months."

"When we are told that one pound of refined uranium is equal in heat content to some 1,500 tons of coal, the importance of this development is apparent. We have a great new power source right here in our province."

Focussing attention on the question of human resources, Mr. Frost expressed the conviction that the nuclear demonstration plant would



serve as a training ground for technical personnel, besides its contribution to the power resources in the immediate future.

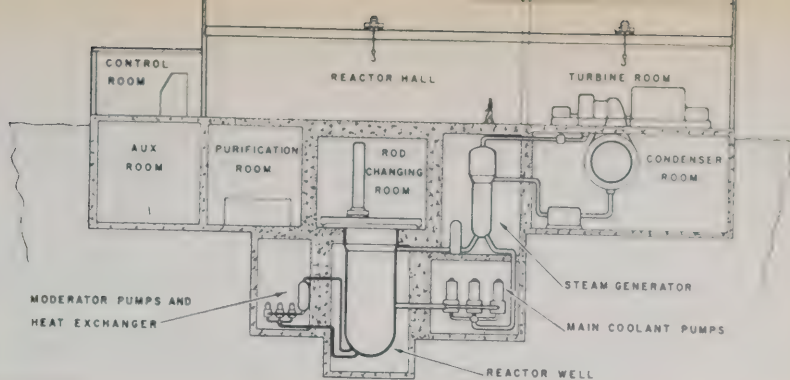
This, in itself, was a matter of great importance in view of the shortage of engineers and scientists needed in the years ahead to develop Canada.

"Here then, in the important field of human resources, we have the effort of governments, educators, business and industry combining, not only to add power to our resources, but what is more important, adding men and women with scientific training to our ranks."

The conclusion of Mr. Frost's address brought the ceremony to a climax. Stepping down from the platform with Mr. Bennett, Dr. Hearn and H. M. Turner, Chairman of the Board of Canadian General Electric Company Ltd., the chief participants used the ceremonial spades to lift the sods for the first Canadian nuclear-electric plant. The large audience rose as the band of the Royal Canadian Dragoons from nearby Petawawa struck up a lively tune, amid a hearty burst of applause, while newsreel and press cameras recorded the event for posterity.

In pronouncing the invocation, Rev. Father L. Gauthier, Des Joachims, besought guidance for those charged with the serious responsibility of leading Canada through this promising new period of development and stressed the necessity of a sense of humility in unlocking the secrets of the future. Rev. A. G. Skelly, Rolphton Community Church, in dedicating the project, said that the presence of ecclesiastical representatives at such a ceremony symbolized the link between science and religion. Reminding the audience that the new venture carried with it new responsibilities, the electric foresaw a new era in which the two forces would march together for the benefit of mankind.

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SCHEMATIC DIAGRAM OF THE NUCLEAR POWER DEMONSTRATION PLANT

## HOW "N.P.D." WILL FUNCTION

**P**OPULAR misconceptions may exist as to the exact function of the reactor section of this type of generating station. In brief, the reactor merely provides heat for making steam; it replaces the boiler of the conventional thermal station.

At "NPD," uranium from Canada's own mines will be used as a fuel. Sheathed in zirconium to prevent corrosion from the heavy water and to retain the radio-active fission products formed when uranium atoms split, 120 rods of the fuel will be placed in the reactor core.

There will be two heavy water systems. One of these, which will not come into contact with the fuel rods, will act as a moderator for the neutrons and will be circulated by pumps through a heat exchanger to keep its temperature between desired limits. A moderator is necessary because, when atoms of uranium-235 split, neutrons are given off at tremendous speed; these must be slowed down or "moderated" by some medium that does not capture neutrons readily before they will split other uranium-235 atoms and maintain a chain reaction.

The other heavy water system, the "coolant," serves to carry heat from the fissioning uranium fuel to the heat exchanger. Flowing through tubes surrounding the hot fuel rods,

this heavy water has its temperature raised to about 500 degrees F. (260 degrees C.) before leaving through pipes at the top of the reactor. From here it passes to the main heat exchanger and gives up its heat to a secondary system of ordinary water.

The ordinary water, converted to steam by the heat, will then be used to drive a turbine, which, in turn, will actuate the generator to produce electricity. The cycle of the ordinary water is continued through a condenser and a pump back to the heat exchangers.

Although it is recognized that electric energy from this plant will not be competitive in cost with plants using conventional fuels, the experience gained in building the demonstration plant is expected to:

1. Demonstrate that electricity can be generated by a nuclear plant of such a design and to provide information for the construction of a large-scale station;
2. Provide practical data on the economics of power production with nuclear plants;
3. Provide experience in design and operation, particularly on those aspects which differ from research reactors;
4. Train personnel, both in plant design and in operation.

# HISTORY OF NUCLEAR POWER

FOR centuries scientists believed the atom to be the smallest indivisible particle of matter. In 1905 the German-born physicist, Albert Einstein, announced his Theory of Relativity—demonstrating mathematically that matter is a form of energy, and that a very small amount of matter can be transformed into an enormous quantity of energy. The theory seemed perfect, but the physical means of unleashing this energy had yet to be discovered.

In 1934 this was accomplished by giant atom-smashing cyclotrons. But it was the destruction of Hiroshima by the so-called Atomic Bomb at the close of World War II that first brought home to the public the implications of nuclear energy.

Since that time, nuclear science has developed at a rate unexcelled by any other form of research in history. In 1942 an Italian-American physicist, Dr. Enrico Fermi, became the first man to show how the power of the atom could be harnessed for practical use by directing the building and operation of an atomic "pile" (a term since replaced by the word "reactor") at the University of Chicago. This pile initiated a self-sustained nuclear chain reaction and achieved the first controlled release of atomic energy. Over ten years later, on July 18, 1955, 10,000 kilowatts of electric power were fed from an experimental reactor into the transmission lines of a private utility at West Milton in New York State.

In the United States today, two full-scale nuclear-electric power plants are under construction. One, located at Shippingport, Pennsylvania, is the joint undertaking of a private utility and the Atomic Energy Commission, the U.S. Government nuclear agency. Scheduled for completion in 1957, it will deliver 60,000 kilowatts of electricity. The other plant, employing a fast neutron

breeder reactor, is being built in southeastern Michigan by a group of utilities. Named the Enrico Fermi Atomic Power Plant in honor of Dr. Fermi, who died in 1954, the station will have a capacity of 100,000 kilowatts and is scheduled for completion in 1960.

Altogether, plans for six other full-scale nuclear plants have so far been announced in the United States, totalling about 800,000 kilowatts. These plans, if approved by the Atomic Energy Commission, will be carried out by groups composed of several privately-owned electrical utilities.

## United Kingdom Leads

The world's first full-scale nuclear-electric power plant to come into operation is located in England. Known as Calder Hall, this plant is already running successfully on open circuit and began to feed power into Britain's national grid in October, 1956. Eventually, Calder Hall will generate 92,000 kilowatts of electricity. It will also produce plutonium as a by-product for use in the nuclear research reactors of that country. The sale of this material, coupled with the high cost of coal in the United Kingdom, will enable Calder Hall to supply power at the same cost as that produced by Britain's conventional coal-burning stations. Three more stations of the Calder Hall type are, at present, under construction, one adjacent to the original plant and two in Dumfriesshire, Scotland.

In addition, Britain last year announced the commencement of a 10-year program under which the Central Electricity Authority would construct, own and operate 12 nuclear power stations, the plant and equipment for which would be supplied by private firms. This program called for construction to commence on two nuclear power stations in 1957, two more in 1958-59, and so

on at an accelerating rate until the completion of the twelve stations in 1965—their combined output to be somewhere between 1,500,000 and 2,000,000 kilowatts.

In August, 1956, important changes were made in this program, full details of which will be made public in November. Broadly, these changes will mean the building of 16 nuclear stations instead of 12, each new station to have perhaps twice the electrical capacity of those first envisaged. The combined output of these 16 stations will probably be between five and six million kilowatts, representing the consumption of almost 18 million tons of coal per year in conventional thermal-electric stations.

## Canada's Contribution

Canada has contributed considerably to the international store of knowledge of nuclear energy, mainly through basic research at Chalk River, where Atomic Energy of Canada Limited operates two heavy-water reactors. Designed for research in fields other than power production, these reactors have enabled Canadian scientists to delve deeply into the secrets of the atom. One of these reactors, known as ZEEP, was completed in September, 1945, and was the first to operate outside the United States. The other, NRX, was completed in July, 1947.

In 1951, the Canadian Government decided to construct a larger and improved heavy-water experimental reactor, which could also produce significant quantities of plutonium. This reactor, to be known as NRU, is scheduled to come into operation this year. It will develop 200,000 kilowatts of thermal power compared to the 40,000 kilowatts developed by NRX. The utilization of NRU and NRX will provide Canada with some of the best radiation facilities in the world.

Early in 1954 Canada enlarged her nuclear research program to include feasibility studies of reactors

*(Continued on page 27)*



# LOAD GROWTH FACTS

Convention speakers stress need for expansion of distribution systems



△ TAKING a "break" during convention proceedings, S. R. Walkinshaw, Orillia (left); A. R. Siegrist, Chesley, express animated interest as Walter Dixon, Arthur, discusses utility matters.

A LOOK at one of the major problems facing Ontario Hydro and the associated municipal utilities, in the light of the province's economic and population boom, highlighted sessions for more than 250 delegates attending the 1956 annual meeting of the Georgian Bay Municipal Electric Association.

Held at North Bay this year, the convention was regarded as one of the largest in the history of the district association. The two-day gathering, which opened with an official welcome from H. B. McCubbin, Chairman of North Bay Hydro-Electric Commission, featured discussions on a variety of topics, ranging from load growth to utility insurance.

Focussing attention on load growth problems, J. M. Hambley, Ontario Hydro's Assistant General Manager — Administration, stressed the need for expanded distribution facilities to meet soaring power demands.

The speaker congratulated municipalities in the Georgian Bay Region on the rate of growth in the past decade, emphasizing the fact that it had exceeded the rate of growth for the entire Southern Ontario System during this period. Enlarging on this subject, Mr. Hambley said that the regional load had increased from 50,000 kilowatts in 1945 to 136,400 kw. at the end of 1955.

This represented an annual regional rate of growth of 10.6 per cent a year, compared with an an-

nual increase of 8.2 per cent a year throughout the overall Southern Ontario System.

## Rural Demands

Dealing with increased demands for power in the rural areas of Ontario, Mr. Hambley said that the number of miles of rural line in the region had increased 162 per cent in the past 10 years. The total number of rural customers, farm and non-farm, was 22,698 in 1945, increasing by 235 per cent to 76,053 in 1955. Thus, approximately 89 per cent of the farms in the Georgian Bay Region were now electrified.

Mr. Hambley also traced the rate of growth of primary power requirements in the Commission's three operating systems.

"Projecting this load growth to 1980, we are faced with the staggering conclusion that Ontario Hydro may, by that year, be called upon to have total power resources amounting to 23.6 million kw."

## Planning Required

Emphasizing the impact of this expansion on the municipal systems, the speaker stated that it represented a challenge, "which can only be met by careful and far-sighted planning on all levels of power production, transmission and distribution."

Dealing with the load growth problem at the municipal level, Harry Hyde, Assistant Chief Engineer, Toronto Hydro, described it as the greatest single factor influencing the electrical industry in the last five years.

During an interesting and informative address, Mr. Hyde, who used the Toronto area as an example,

*(Continued on page 8)*



indicated that load growth, due to Ontario's building boom and population increase, was only one facet of the problem.

One interesting aspect of this ever-growing use of electricity was the increased load density in cities, towns and rural areas where a constantly increasing motor and appliance load had been evident.

Serious consideration had to be given to distribution methods radically different from those of the present, Mr. Hyde said.

Another convention highlight was a panel discussion with W. Ross Strike, Ontario Hydro Vice-Chairman, acting as moderator. The panel focussed attention on some insurance problems common to municipal

Hydro commissions, with H. G. Robertson, Barrie; S. R. Walkinshaw, Orillia; G. F. Hutcheson, Huntsville, and B. M. Graham, North Bay, participating in the discussions.

The panel dealt specifically with the question of a group fire insurance scheme for local utilities. Mr. Robertson, one of the panelists, stated that local utilities would be suitable for group coverage, since a basis of common interest and handling could be provided.

Further discussion indicated that the cost of such a group policy should be less than the total premiums for each individual property. Panel members pointed out, however, that a central administration unit would be necessary to handle the insurance if the group scheme were to work successfully.

In such a group policy, Mr. Walkinshaw said, there would be only one premium paid, and this, in turn, would be broken down and the proper proportion assessed against each local utility. The panelists agreed that it would be necessary to develop full information regarding values and the properties covered, together with a complete loss record covering a period of approximately 10 years, before it would be possible to predict the full premium rate of such a policy.

The panel pointed out that there were three different policies available—1. the standard policy with loss payable on replacement cost less depreciation of the life of the building or equipment.

2. replacement cost without depreciation.

3. co-insurance in which the insured carried part of the risk, generally 20 per cent.



A LOOK at the registration table shows Eric Simms, North Bay (standing, extreme left), keeping an eye on things, while Wayne Dale (left) and Al. Ashford, both of North Bay, handle registrations for (left to right): D. A. Evans, Arthur Spence and Frank Maurino, all of Bradford; Harry Foy, Toronto; H. R. Graham, North Bay, and Glen G. Williams, Gravenhurst.



△ THESE members of the 1957 executive (left to right): Robert Butter, Owen Sound, Secretary-Treasurer; Ontario Hydro Commissioner A. A. Kennedy, Owen Sound, President; C. J. Halliday, Chesley, Past President, and A. T. Smith, North Bay, 1st. Vice-President, seem to be giving serious thought to the problems and activities of the coming year.



The general liability policy covered both the utility and the municipal corporation, but only for the electrical department of the utility and that if other departments were insured for the same risk care should be taken that the corporation was also included in the coverage.

Turning to the subject of group insurance for utility vehicles, the panel made it clear that the Ontario Insurance Act prohibited an insurer from insuring vehicles, subject to experience ratings, except directly with the owner. Mr. Walkinshaw pointed out that it would be possible to establish a central organization to which each utility would transfer ownership of its vehicles. Such an organization would then administer the insurance.

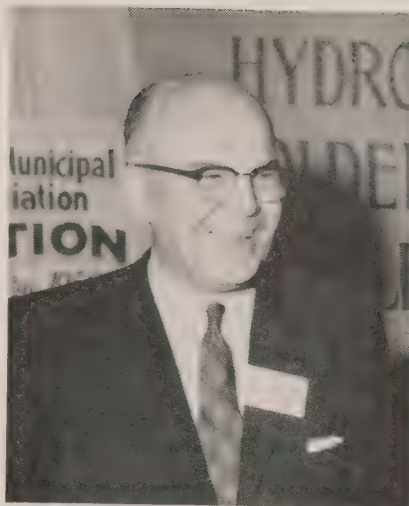
Mr. Strike, in closing the discussion, suggested that utilities might try to establish a special rating with insurance companies by obtaining loss experience ratings on utility vehicles over a possible three-year period. If such a survey proved favorable, a request for a special rating would receive serious consideration by the insurance companies.

### Formed in 1922

C. J. Halliday, Chesley, retiring President of the Georgian Bay Association, in his address to delegates, recalled that the Georgian Bay Association was the first such group in Ontario. It had come into being on May 17, 1922, at Durham, Ont., as the Eugenia Municipal Electric Association with 18 area municipalities as members. Later it became the Georgian Bay M.E.A. and today had a membership of 196 municipalities.

In lauding the work of Ontario Hydro, this year celebrating its Golden Jubilee anniversary, Mr. Halliday said: "The efforts Hydro has made to bring progress to the province and the work of the Commission's early pioneers is a very worthwhile thing."

In an informative talk on rate structures, A. W. Murdock, Ontario



J. M. HAMBLEY  
Assistant General Manager-  
Administration  
Ontario Hydro



HARRY HYDE  
Assistant Chief Engineer  
Toronto Hydro



MAYOR ARMOUR McRAE  
Welland

Hydro's Rate Study Engineer, outlined the new four-block domestic rate structure to replace the present two-block structure in use for the last 35 years. Mr. Murdock described the new system as one aimed at improving the method of collecting the cost of electricity from domestic customers.

The two-block system had been quite adequate when it was first put in use, Mr. Murdock said, but heavier household use of electricity today, because of widespread adoption of appliances and motors, had made it necessary to find a new rate structure. The four-block structure would make it possible to shift the increased cost because of appliances, etc., to the larger domestic users without penalizing the smaller household customer.

Bert Merson, Toronto, reported on the work of the Municipal Hydro-Electric Pension and Insurance Committee, while W. R. Beith gave an outline of the activities of the Electrical Employers' Association.

A.M.E.U. President E. A. Washburn, Stratford, briefly outlined the activities of the A.M.E.U. during the past year. A report on the current activities of the Electric Service League of Ontario was delivered by Manager Harry Foy.


The convention voted unanimous approval of a plan to sponsor a \$200 scholarship to promote the education of electrical engineers. The scholarship provides for \$200 to be awarded annually to a graduating high school student from within the Georgian Bay Region, who signifies his intention to study electrical engineering at the university of his choice.

Guest speaker at the annual dinner held at the Empire Hotel was Mayor Armour McCrae, Welland, who urged that delegates and their wives take increased part in political activities at all levels of government.

A. A. Kennedy, Ontario Hydro Commissioner and Vice-President of the G.B.M.E.A., conducted an ab-

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Colorful C.N.E. displays keynote

Hydro's Golden Jubilee

celebrations

# Maps, Models and Murals

**Y**ESTERDAY, today and tomorrow joined hands in the Hydro Building at this year's Canadian National Exhibition in Toronto.

To mark Hydro's Golden Jubilee anniversary, an outstanding display of electrical equipment, maps, murals and intricately - designed models was presented this year.

Among the distinguished visitors welcomed by Chairman Dr. Richard L. Hearn was Hon. Lester B. Pearson, Canada's Secretary of State for

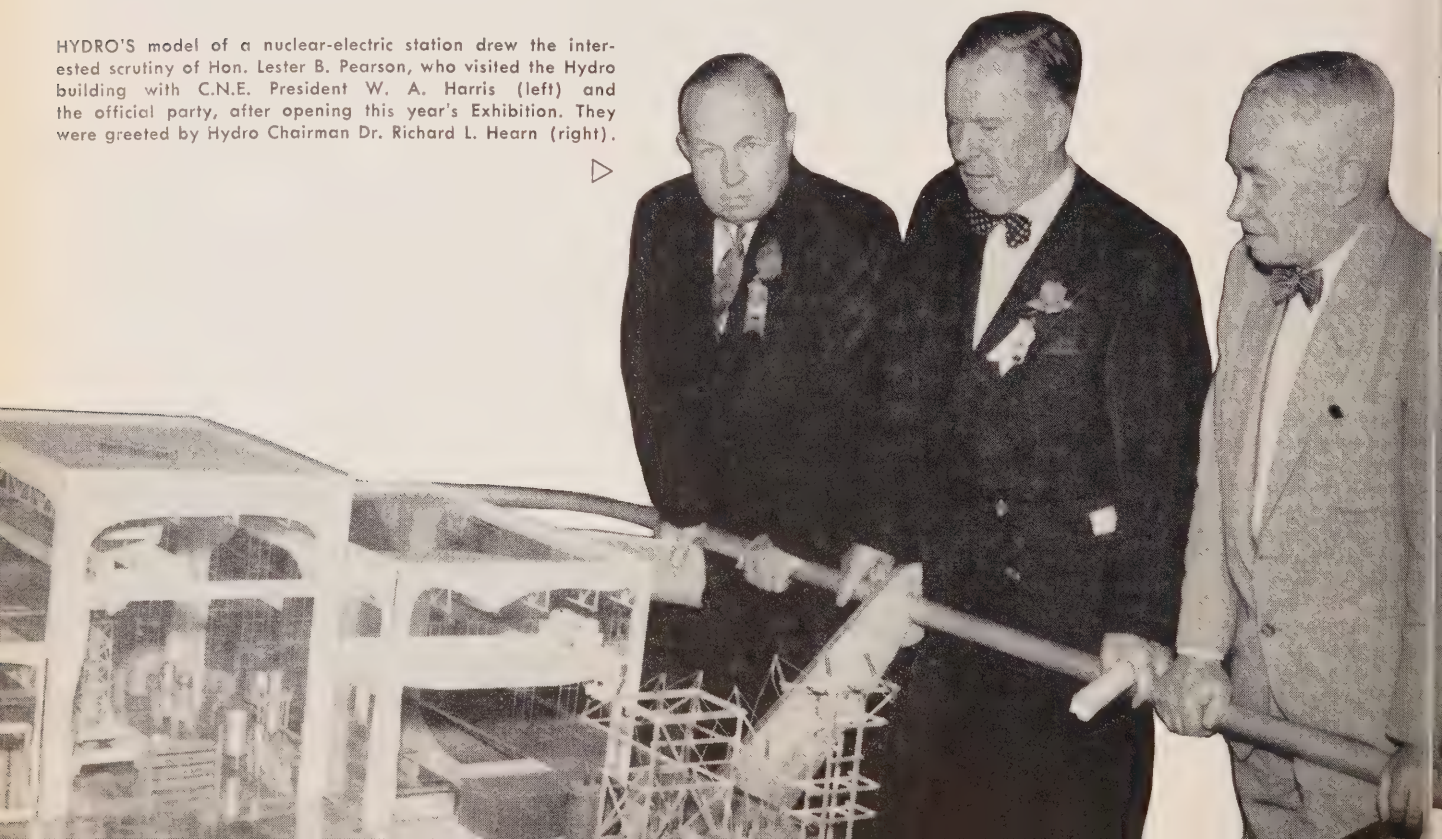
External Affairs, who officially opened the 77th C.N.E.

Mr. Pearson's inspection of the Hydro displays on opening day set the stage for the next two weeks when literally thousands of "Ex" patrons thronged the octagonal building. Labor Day this year established a record as a maximum of approximately 2,000 persons an hour were "clocked" passing through one large room. Here model-makers had created, in minia-

ture, a typical, modern Ontario town, side by side with a model of the same community 50 years ago. Comprising a circle almost 40 feet in diameter, the two model towns contained authentic facsimiles of the public buildings, homes, industries and facilities common to their respective eras.

The 1906 town stood in a rural setting on the banks of a river and had a water-operated mill, a school, court - room, meandering highway

HYDRO'S model of a nuclear-electric station drew the interested scrutiny of Hon. Lester B. Pearson, who visited the Hydro building with C.N.E. President W. A. Harris (left) and the official party, after opening this year's Exhibition. They were greeted by Hydro Chairman Dr. Richard L. Hearn (right).





and one-track railway complete with old-time locomotive. The 1956 counterpart showed the altered landscape resulting from damming of the river for a hydro-electric project, replacing the old one-track railway line with double track, straightening the highway, and the building of a transformer station to "step down" power for industries, homes and offices.

To demonstrate to the fullest extent the impact Hydro has had on modern living, the ceiling lights of the auditorium were dimmed periodically and the lights of the two towns came on, those of the modern community completely outshining the dim glow from the lamps of its older counterpart.

On the walls of the room housing these models were murals indicating the revolutionary effect on business methods, farming, industry, entertainment and housework.

### Nuclear Station Exhibit

Nuclear power is now a definite item on Hydro's expansion plans for the future, and an outstanding feature of the Commission's 1956 exhibit at the C.N.E. was a model of a typical nuclear-electric generating plant.

The model was constructed of clear plastic to enable the public to understand the principles of this type of power generation. Key parts of the plant were colored, and the action of the uranium fuel was traced from the time it is put into the reactor, or furnace, until steam is produced to turn the turbo-generators and generate electricity.

Close attention was paid to detail in constructing the model, even to the inclusion of facilities and accommodation for plant personnel, such as showers and staff changing rooms. Cutaway sections revealed the innermost working parts of the reactor and the generating room, which contains the turbo-generators, condenser and other equipment.

Working of the nuclear power



GRAPHICALLY illustrating the impact of electricity on an average community in the past half-century were two models of "Middletown," which compared the appearance of this typical municipality in 1906 and 1956. These "Ex" visitors listen with interest as Leo Mullen, Hydro Information Officer (holding pointer), describes details of the present-day model.



TWO youthful C.N.E. patrons, Joe McQuade (left), and Michael Stone, of Toronto, examine the miniature generating station, which formed part of the 1956 model of a typical Ontario town.

plant was further clarified by a step-by-step, schematic drawing covering all plant operations.

### St. Lawrence Model

The story of the huge international power development on the St. Lawrence River, a joint undertaking of Ontario Hydro and the Power Authority of the State of New York, was depicted by an electrically-operated "before-and-after" map along with a scale model of the affected portion of the St. Lawrence River. The model showed at a glance how 1,640,000 kilowatts of

electric power (half of which will be Ontario's share), will be produced by the harnessing of the waters of the International Rapids section between Prescott and Cornwall.

Raising of the water level in 1958 will materially alter the appearance of the surrounding countryside, and the electrically-operated map showed the changed St. Lawrence shoreline and positions of the villages in the affected area before work began in August, 1954, and their positions following relocation.

(Continued on page 12)



## Maps, Models and Murals

Replicas of the various features associated with the project were reproduced in the model, including the powerhouse structure, incorporating the Robert H. Saunders-St. Lawrence Generating Station, which will supply Ontario Hydro's share of power — 820,000 kilowatts. Enlarged aerial photographs showed key structures under construction, and an oil painting, measuring 15 by 10 feet, gave an artist's impression of the St. Lawrence Power Project area as it will appear when the power and seaway projects are completed.

### Model Farmstead

City-dwellers and farm folk found a common focal point of interest in the model farmstead on display. Designed to show the many labor-saving uses of electricity on the farm, the model, constructed on a scale of half an inch to one foot, was an accurate reproduction of an Ontario farm, incorporating an up-to-date dairy barn, accommodating 50 head of cattle.

Miniature machinery in the model was actuated by electric switches, showing how Hydro has eased the farmer's work load and increased his productivity.

Also in the rural vein was a mobile demonstration unit that caused great excitement among rural dwellers when it first appeared in the summer of 1912. Known as "Adam Beck's Circus," the unit consisted of a truck surmounted by a canvas awning and carrying a wide range of labor-saving electrical equipment for display to the farming people of southern Ontario. By sending one of these units on tour, Hydro Chairman Beck (later Sir Adam Beck) was able to show that electricity could be used to do many of the chores about the farm and in the farmhouse.

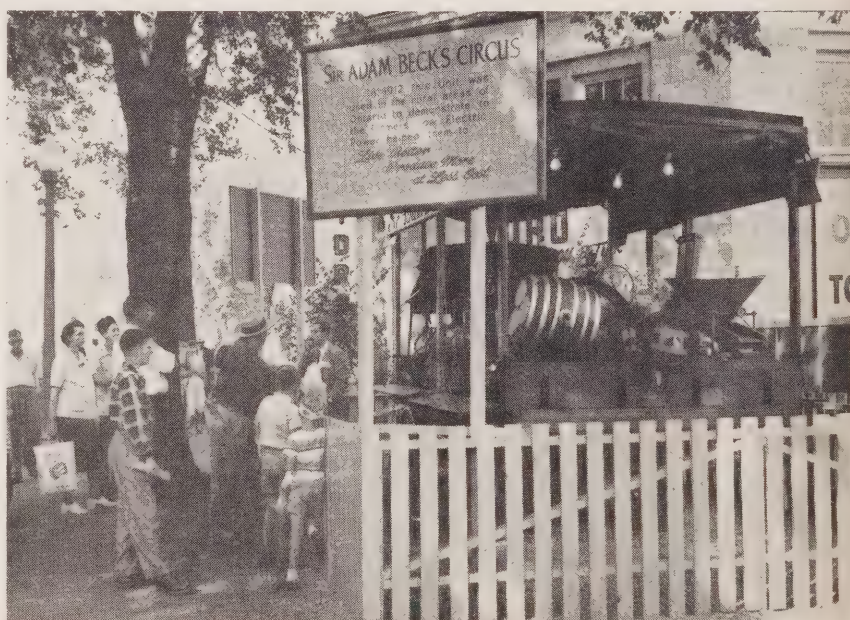
The first of these rural demonstrations was held on a farm in Toronto Township. Electrically-driven cream separators, among other pieces of equipment, made a favorable impression on the men present, while their wives marvelled at the way in which electric toasters, washing machines and vacuum cleaners could make their housework easier.

The truck on view at the "Ex," outside the Hydro building, which was assembled as part of Ontario Hydro's Golden Jubilee observance, was equipped with folding running

boards, from which demonstrators used to explain the operation of the outfit. A 15-foot jack-shaft belt connected to a three-horsepower, 110-volt, three-phase induction motor mounted on the platform of the truck was employed to operate a mechanical milking machine, a steel frame circular saw, a washing machine, a cream separator, a churn, a butter-worker and a windmill pump. A 150-gallon automatic rotary pump, equipped with a quarter-horsepower motor and a small electric stove, were included in the original equipment.

Electricity now has more than 400 uses on the modern farm, and C.N.E. visitors were interested to compare these early pieces of electric apparatus with their counterparts of today.

A popular exhibit making a repeat appearance this year was a working model of the Stewartville Generating Station on the Mada-waska River near Arnprior. Hydro's model-makers succeeded admirably in reproducing the awe-inspiring appearance of the dam, which, in reality, rises steeply from the river bed to a maximum height of 206 feet and bridges the 1,300-foot gap between the cliffs through which



▶  
SALUTING Hydro's Golden Jubilee Year, this truck, which travelled through rural Ontario in 1912 as part of the Sir Adam Beck Circus, had an effective role in the Hydro exhibit.



the river once flowed without obstruction. A scale reproduction of one of the station's three, 14-foot diameter penstocks (the steel pipes used to convey water down the face of the dam to the turbines) was constructed in transparent plastic, permitting a view of the water rushing down this penstock and entering the scroll case to turn the turbine.

### Frequency Changover Trailer

Standing outside the Hydro Building was a mobile frequency standardization information trailer. Visitors were provided with "on-the-spot" details of the work being done by Hydro in the tremendous task of changing frequency-sensitive items in southwestern Ontario from 25 to 60 cycles. It is expected that the changeover program will be concluded in 1959, and Hydro information officers were on hand to explain such items as "cutover" maps showing the approximate dates when standardization will be carried out in districts still receiving power at 25 cycles.

An interesting feature was a display illustrating the method of changeover for a standard - type sealed-unit refrigerator, showing one

of the 60-cycle replacement units used to convert these appliances. One wall of the trailer was taken up by a series of relief illustrations telling a picture story of the sequence followed for domestic changeover, from the time first contact is made with the householder by mail, until the actual day of changeover some five to six months later.

### Toronto Hydro Display

The Toronto Hydro-Electric System arranged a very interesting display in the Hydro Building at this year's Canadian National Exhibition, featuring progress in electrical living over the past half-century.

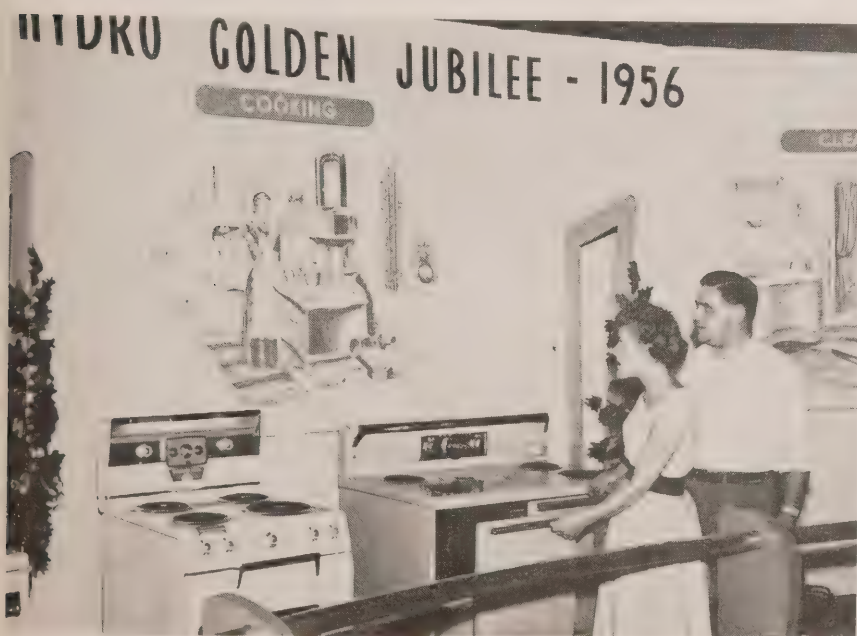
Keynoting the presentation was a "Tunnel of Contrasts" lined with murals showing the electrical appliances of by-gone years in the fields of heating, cooking, cleaning, refrigeration, lighting and home entertainment. Standing before each graphic representation, for comparison purposes, was a modern counterpart from the Toronto Hydro Shop.

Of special interest to home-lovers was a display of major electrical appliances, including a washing machine, dryer, stove, and refrigerator

arranged on a specially-constructed sloping shelf for easy viewing. An intriguing exhibit in another section of the Toronto Hydro display consisted of pieces of old-time electrical equipment, collected from all over the province and so arranged as to demonstrate the gradual evolution in design and performance up to the present day.

The popular "Magic Mirror" this year featured a typical kitchen of the year 1896, reproduced even to the pattern of the wallpaper, beside a streamlined, ultra-modern, electrical kitchen of 1956. Torontonians were interested in two enlarged photographs of a familiar street intersection of their city — the corner of Yonge and College Streets — as it appeared in 1912 and as it is today. The former showed the wooden poles that supported trans-

*(Continued on page 28)*



△ MR. AND MRS. A. M. Thomson, Toronto, recall old times as represented by the iron held by Alex. McTavish, Toronto Hydro, right.

△ IN THE Toronto Hydro section, Mr. and Mrs. John McNaughton, Toronto, were noted comparing the streamlined electric ranges with the 1906 stove portrayed in the sketch above.



## SERMON IN STONE



HYDRO'S 18-storey Head Office on University Avenue was completed in 1941. The original building, left, was first occupied early in 1916.

**Symbolized by an 18-storey structure on Toronto's University Avenue today,  
Hydro's Head Office was a modest, rented suite of three rooms 50 years ago**

**A**LTHOUGH the immortal William Shakespeare penned "As You Like It" more than three centuries ago, this line from the play "... books in the running brooks, sermons in stones and good in everything" might well apply to Ontario Hydro.

The running brooks, in a sense, constitute the major source of power for the Commission, while its present Head Office facilities in Toronto represent a sermon in expansion.

Fifty years ago the Head Office was a very small "sermon" of only three rooms, located on the second floor of the National Life Assurance Building at Toronto and Ade-

laide Streets, Toronto. These quarters were secured following a resolution which directed: "... that the Commission jointly rent with the Temiskaming and Northern Ontario Railway six rooms in the National Life Chambers at \$120 a month." This original Head Office housed a staff of seven, but it soon became too small as the Commission came to grips with the task of providing power at cost for the people of Ontario.

By 1908 the sixth floor of the Continental Life Building at Bay and Richmond Streets had become Hydro's headquarters. At that time a score of employees were already

"BEFORE-AND-AFTER" might be the title of these photographs showing University Ave. in 1906 (left) and as it looks today from almost the same point. The older view was known as a pin-hole photograph—the range of the camera being restricted by the fact that no lens was used.



crowding the new offices. The staff supplemented its size by a display of sheer stamina that year when new hours of employment were assigned: 8.00 a.m. to 12.00 noon; 12.30 p.m. to 6.00 p.m.; 6.30 p.m. to 9.00 p.m., Saturdays included — a 72-hour week to try to meet the backlog of work of an organization that has never stopped growing!

By 1910, even with the 72-hour week in force, the staff had increased to approximately 80 and the Head Office had been enlarged to 10 rooms. These rooms included Chairman Adam Beck's private office and other private offices, many of them evolving from the partitioning of larger rooms.

Hydro's telephone operators in those early days (no doubt recruited from the ranks of girls blessed with super-acute powers of hearing), carried on their work with six stenographers pounding away at noisy typewriters nearby.

Office equipment was at a premium in these early years for Commission documents were compressed into only four filing cabinets.

As the staff increased over the years, offices were rented on other floors of the Continental Life Building, and some employees were accommodated in the I.O.O.F. Temple Building at Bay and Richmond Streets.

### Two Shared One Desk

"Before moving to University Avenue we were really short of space," states Charles G. McEvoy, who recently retired as Hydro's Records Officer after some 45 years' service. "Short of space" is almost an understatement, recalls Mr. McEvoy, who has vivid memories of accommodation problems before World War I. The Municipal Auditor, Cost Accountant and engineers — seven or eight men in all — were not only crowded into one small room, but two men shared one desk! At that time, too, the Municipal Department staff occupied one small room.

These cramped quarters and the difficulties encountered in renting additional office space influenced the Commission's decision in 1914 to erect an administration building,

which, the minutes stated, would "take care of the present needs and future growth of the staff." After considering several locations, a site was chosen on University Avenue just below Orde Street.

Problems were encountered in securing a suitable foundation for the new Head Office, because an extensive bed of quicksand lay beneath a ravine and a creek, which had, at one time, flowed across the building site. To cope with this situation, caissons were sunk to rock surface some 60 feet below street level. As a consequence the first Head Office building is virtually supported by 28 concrete pillars, each 50 feet high.

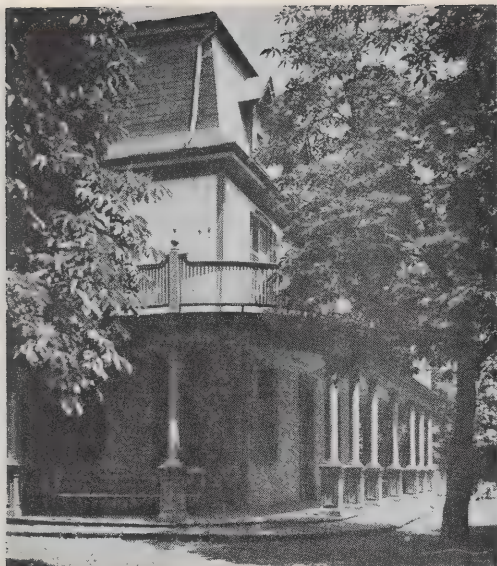
Early in 1916 the staff began moving into the six-storey structure of simple classic Greek design. This first Commission-owned office building provided 23,700 square feet of usable floor space, sufficient for a staff of 240. Engineers and others presumably were able, by now, to enjoy the luxury of a desk each. In the basement was a staff dining

*(Continued on page 16)*

by FRANK C. WOOD







THIS building, known as the Caer Howell Hotel, once stood at the corner of Orde St. and University Ave., near the site of the present Head Office building.



EXCAVATION for the foundations of Hydro's first Head Office was in full swing when this photograph, looking northwest from University Ave. was taken on St. Patrick's Day, 1915. Horse-drawn vehicles were used to draw away the earth and rock.

room, the kitchen being "practically electric throughout, all cooking being done on heavy-duty electric ranges," the *Ontario Hydro Bulletin* records.

The growth of the Commission's operations was so rapid, however, that, in the same year the new Head Office proved inadequate. Private homes on Murray Street were acquired to accommodate additional staff. Thus, while some engineers worked in the stately Head Office, others planned hydro-electric stations in erstwhile parlors and kitchens.

### 18-Storey Building

Shortage of space proved a recurring problem, and from 1920 it became necessary to rent additional quarters in various sections of Toronto. To remedy this situation, plans were drawn up and approved in the early 1930's for an 18-storey addition next to the original administration building. These plans were amended and only six storeys were built initially. The Head Office staff was consolidated in this new

building and also in the adjoining structure of earlier vintage on July 1, 1935, employees being brought in from some 14 other buildings in Toronto. This additional space proved to be only a temporary expedient as expansion of Commission services throughout Ontario resulted in parallel staff increases. Soon it became necessary to locate staff in other buildings. In 1939 the pressure of circumstances forced the decision, despite the war, to extend the six-storey addition to the 18 storeys originally planned. Said the *Hydro Bulletin* of March, 1940: "When complete, at a cost of \$1,100,000, the building will be immediately occupied to 80 per cent capacity, and should the St. Lawrence, or some other major power development be approved, the entire space will soon be fully utilized."

Early in 1941, the staff was once again consolidated in the enlarged Head Office, which, with 165,300 square feet of floor space, could accommodate some 1,480 employees.

Despite the completion of the 18-

storey structure on this important Toronto thoroughfare, the Commission's accommodation problems were far from being solved. The end of hostilities in 1945, far from causing the anticipated reduction in power demands, increased them on a scale unprecedented in Hydro's history, straining the available space for the Head Office staff to the breaking point. To meet this situation, a temporary building of two floors, consisting partially of surplus Bailey Bridge material, was constructed on Murray Street, at the rear of the main building, and occupancy began in November, 1947.

In 1948 some respite was afforded by the movement of a substantial section of the staff to nine regional offices in strategic locations throughout Ontario.

This was only a momentary "breather," however, as the accelerated program of expansion in every section of Ontario was having a dramatic effect on the number of Head Office personnel necessary to handle this prodigious effort.



The following year, a long-term lease was taken on a five-storey building at 49 Bathurst Street in Toronto serve as headquarters for the newly-created Frequency Standardization Division.

### Postwar Building

The postwar Head Office building program continued in April, 1948, when work commenced on the Service Building on Orde Street. Its three floors and ground floor now provide accommodation for more than 450 employees. Occupancy started in February, 1949, when the Printing Department installed its equipment on the ground floor.

The A. W. Manby Service Centre at Islington, in addition to housing several departments of the Frequency Standardization Division, has also, at different times, accommodated staffs from various Head Office departments.

The summer of 1952 saw a power shovel excavating a foundation for a new Engineering Building at Murray and Orde Streets. This was

to provide 87,000 square feet of space on five floors and ground floor and accommodation for auxiliary equipment on smaller sixth and seventh floors. Shortage of steel delayed construction, but in May, 1954, the vanguard of a staff of over 800 employees associated with Planning and Engineering Divisions began occupying the new building.

Thus, today this concentration of buildings, on or near University Ave., constitutes a major nerve-centre of the province, publicly-owned Hydro system.

### Two Memorials

The Commission's association with University Ave. since 1916 has been further strengthened by the location of a statue to the memory of Sir Adam Beck — Hydro's first Chairman and one of its chief architects — at the junction of Queen St. and University. A further link will be the establishment of a

memorial to another Hydro Chairman, the late Robert H. Saunders, now under construction at College St. and University Ave.



Once a quiet street, known as College Ave. around 1888, University Ave., has changed rapidly even in the past half-century. Today in place of rows of rare, imported chestnut trees, this much-travelled thoroughfare is flanked by tall and impressive buildings. Gone too, or scheduled to disappear

soon, are many of the old homes, including No. 561, where a girl, destined to earn a new kind of fame in faraway California (Mary Pickford, the "world's sweetheart" of the silent movie days), was born on April, 1893. Proud of its distinction as one of Toronto's busiest and foremost streets, University Ave., nevertheless recalls its Victorian grandeur with a distinct feeling of nostalgia.

ON MAY 1, 1934, Hon. J. R. Cooke, Hydro Chairman at that time, (shown operating the large power shovel) officiated at a brief ceremony inaugurating construction of the 18-storey Head Office.



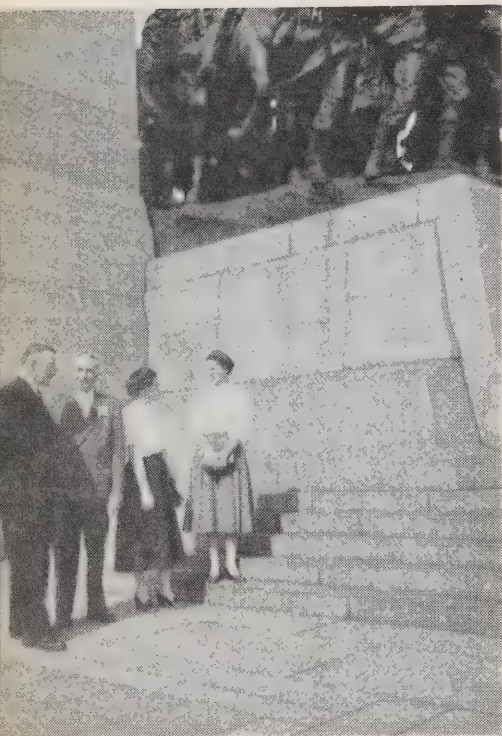
SIX STOREYS of the present 18-floor building were occupied in 1935. During 1939 the Commission undertook construction of the remaining 12 storeys to keep pace with general system expansion.





# Record Registration

## E.O.M.E.A. Delegates Meet at Ottawa



△  
H. S. GRAHAM (left) and Reeve Douglas Cunningham, both of Newcastle, with Mrs. Graham and Mrs. Cunningham, were noted chatting beside Canada's National War Memorial in Ottawa.



△  
MRS. E. A. WASHBURN, Stratford (left), and Mrs. Gordon Fuller, Windsor, wearing the special insignia designed for the wives of the Presidents of the A.M.E.U. and O.M.E.A., admire flowers in Chateau Laurier lobby.

**T**HIS year's Eastern Ontario Municipal Electric Association Convention held in Ottawa on September 12-13 honored Canada's capital city by attracting a record registration of 180 delegates.

President J. G. Baldwin's inaugural address revealed a healthy membership position generally, for, of a total of 73 eligible municipalities, 67 are members of the association.

The busy and informative two-day meeting, which included a report from the Municipal Hydro-Electric Pensions and Insurance Committee, papers on municipal load growth by Harry Hyde, Assistant Chief Engineer, Toronto Hydro, and the four-block rate structure by A. W. Murdock, Ontario Hydro's Rate Study Engineer, and a panel discussion on general insurance, was highlighted by a visit to the Ottawa Hydro-Electric Commission's new headquarters, now nearing completion.

Delegates travelled by bus to the new building, situated on Albion Road, and enjoyed a buffet supper as guests of the Ottawa utility.

Ontario Hydro Chairman Dr. Richard L. Hearn congratulated the Ottawa Commission on the selection of a site, suitable for expansion and predicted that the city was on the threshold of an accelerated expansion of its electrical system.

The new headquarters building will be officially opened on completion of construction, expected within the next two months, Ottawa Hydro Chairman Stanley Lewis announced.

Registration continued on the second day, and by 9.30 a.m. the delegates, almost filling the convention hall of the Chateau Laurier,

had got down to business.

Remarking that the A.M.E.U. and O.M.E.A. were interlocked through the constant association of management and commissions across the province, Gordon H. Fuller, O.M.E.A. President, said the two bodies are links by which the policies of Ontario Hydro are brought to the local utilities. Urging delegates to familiarize themselves with Hydro affairs, he said that O.M.E.A. district executive committees could be considered as schools for Hydro training, and presented a path into broader fields of service.

### Pensions and Insurance

"We have all heard of the book 'The Egg and I,' and the movie 'The King and I,' but I have to tell you that my interest is the 'P. and I.," said Bert Merson, Toronto, Secretary-Treasurer of the Municipal Hydro-Electric Pension and Insurance Committee.

Discussing the view held by some commissions that it was hardly necessary to include women members of their staffs in pension schemes, because it was probable that they would leave in order to marry, Mr. Merson said this could be an incorrect assumption, pointing out that the Toronto Hydro-Electric System had 47 women members in its quarter-century club.

Drawing attention to the fact that expanding utilities could recruit experienced Hydro managers and workers only from other utilities, he stressed that such desirable personnel, employed by utilities operating pension schemes, could hardly be expected to lose their equities in such schemes by transferring to utilities where a pension plan was not in effect.



Turning to resolutions presented to the convention by a committee comprising: George E. Findlay, Carleton Place; Dr. R. A. Patterson, Kemptville, and L. L. Coulter, Ottawa, delegates considered a resolution from Carleton Place P.U.C. concerning cost of power to municipalities close to generating stations. Discussion produced agreement that Ontario Hydro be requested to advise the E.O.M.E.A. when a change in the method of costing was contemplated.

Stimulating even more extensive discussion was a resolution from Arnprior Hydro-Electric Commission recommending that a new subdivision be required to pay the full cost of installing the necessary (electrical) facilities and relinquishing title to the local Hydro commission after completion. This resolution was referred to Ontario Hydro for consideration.

### Teaching Profession

A civic welcome was extended to the delegates by Ottawa's Mayor, Dr. Charlotte Whitton, while a college contemporary, William F. Kendrick, Principal of the Ottawa Teachers' College, gave an inspiring address on the profession of teaching.

Mr. Kendrick said that some rural

districts had deteriorated in human resources because education had been away from the environment rather than toward the improvement of it. Therefore, potential leadership had been directed into other fields.

Suggesting that many people cared more for their cars than their children, the speaker stressed that: "Most of you entrust your car repairs to a mechanic about whom you have made some inquiries, but many people never have seen those who teach their children and never will see them."

Stating that society had reached a crisis, Dr. Kendrick remarked that his business friends had become worried about teachers, being concerned about those who were to teach the engineers of tomorrow.

"If industry wants leaders they must train them. We want the best graduates from the secondary schools, and the only way to get them is to pay for them. We can be thankful that there are those who over the years have made the sacrifice — they like their jobs."

Turning from teaching to insurance, delegates listened to a discussion by a panel comprising Mayor R. M. Simpson, Arnprior; Richard Raine, Chairman, Peterborough U.C.; O. H. Scott, Manager, Bel-

leville U.C.; M. J. Elliott, Bowmanville P.U.C. Commissioner, and I. K. Sitzer, Director of Ontario Hydro's Consumer Service Division.

### A.M.E.U. Activities

Brief reports on A.M.E.U. activities were made by C. B. Campbell, Trenton, and J. H. Page, Renfrew. President E. A. Washburn stated that A.M.E.U. operating expenses were running about \$1,000 per month and warned that increased fees would be necessary next year.

During a discussion of the venue for the 1957 convention, Richard Raine extended a cordial invitation to hold the sessions in Peterborough.

Thunderous applause from the delegates approved the proposal by M. J. Elliott of Bowmanville, Chairman of the Nominating Committee that the present officers and directors serve for another year: President, J. G. Baldwin, Lindsay; Past President, E. V. Dyke, Smiths Falls; 1st Vice-President, Dr. R.A. Patterson, Kemptville; 2nd Vice-President, H. S. Graham, Newcastle; John Lighbody, Lindsay, Secretary-Treasurer; Directors: Col. James Harris, Kingston; George E. Findlay, Carleton Place; L. L. Coulter, Ottawa; Frederick Hills, Peterborough and Earl J. Bryant, Whitby.

— by Frank C. Wood.

J. G. BALDWIN, Lindsay, was unanimously re-elected E.O.M.E.A. President for the coming year.

OTTAWA'S MAYOR, Dr. Charlotte Whitton, wearing her chain of office, extended an official welcome to the delegates.

JAMES H. MOFFAT, Napanee Commissioner (left), jokes with his son, T. J. Moffat, Listowel, President of District 6 O.M.E.A.



# A CHIP OFF THE OLD POTATO

**A**CCUSTOMED to frying potatoes in an ordinary pan, the average housewife might find the mammoth skillets at the Hostess Food Products plant fascinating, but perhaps a little awe-inspiring.

This enterprising firm, which produces the now-famous Snyder's Hostess Potato Chips in its plant near Preston, Ont., has two of these big pans. Measuring 20 feet long and four feet wide, the out-size fryers, which hold a maximum of six inches of melted shortening, are among the important pieces of equipment utilizing electricity at this busy rural establishment.

It all began more than 20 years ago when Edward G. Snyder started making potato chips in his mother's kitchen. The end of World War II saw potato chips attain new popularity as a nutritious and delicious snack. In fact, for some meals, such as those around the TV set, it could be argued that the hitherto lowly potato chip has assumed the position of a staple.

In the summer of 1955, Mr. Snyder, who had moved from his mother's kitchen to buildings located on the Snyder 1,000-acre farm, sold the business to Elgin W. Vanstone. General Manager of the venture is personable and energetic Hermann Neff, who came to this country some five years ago. In Germany, Mr. Neff had majored at university in business economics but had no idea at the time that he would be putting this knowledge to use in far-off Canada providing the public with a chip off the old potato.

This highly-electrified rural enterprise gives employment to more than 100 men and women from the surrounding district. During the summer this figure often jumps to 150. Furthermore, local farmers find a convenient market for their potato crops, as the factory uses on an average of 500 bags daily—in other words 37,500 lbs. of potatoes.

## Western Canada Market

Every day too, the firm ships out

some 4 to 5 thousand boxes of chips, each box containing an average of 24 bags of different sizes. The boxes are shipped to almost every point in Ontario, and as far west as Edmonton.

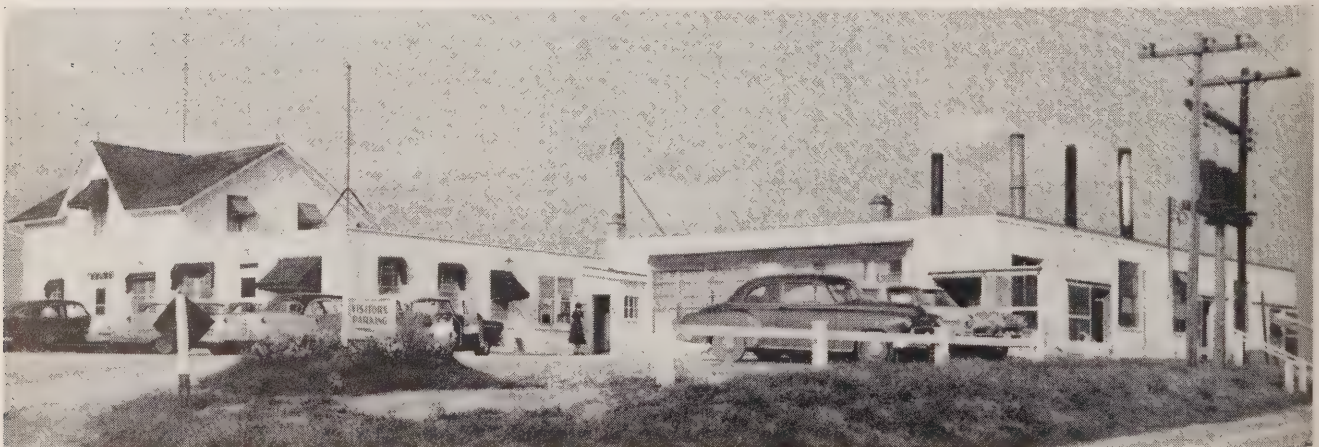
Not every potato variety will "chips," as the trade term goes. In the early season, Hostess uses Cobblers, switching later to Sabagoes and still later to Russets.

Potatoes are not the cleanest vegetable to handle as the experienced "digger" will readily agree. Thus, it is surprising to find the Snyder product made in an atmosphere of rigid cleanliness. An inspection of the methods employed in turning out huge quantities of the succulent potato chip here readily reveals the reasons for this spotlessness.

## Kitchen Police

When the potatoes have been trucked in from the fields or from storage, they are lifted from the truck by electric conveyors into the

EXTERIOR VIEW OF THE HOSTESS FOOD PRODUCTS PLANT NEAR PRESTON.





With the aid of electricity, Hostess Food Products plant

near Preston has become a flourishing rural industry

by Horace Brown

bulk bin. Another electric conveyor delivers the potatoes into two abrasive potato-peelers, the automatic and efficient "kitchen police" of the plant. At the same time, the potatoes are washed.

From the peelers the conveyor carries the vegetables to the chipper. The chips then find their way along the electrically-operated conveyor belts to the aforementioned frying-pans, which produce about 900 lbs. of chips an hour. Thanks to electricity, the whole operation is a continuous and automatic process, with one man controlling the peeler and another man in charge of the frying. When the potatoes are cooked, fine salt, mixed with "anti-oxidants," is applied.

### Electronic Bagging Devices

After flavoring has been added, the chips are wheeled into the bagging room, all the time giving off an aroma that would whet the appetite of a confirmed dyspeptic. In the bagging room, electronic devices practically fill and seal the bags by themselves . . . and always to the right amount! The bags are then boxed and shipped out.

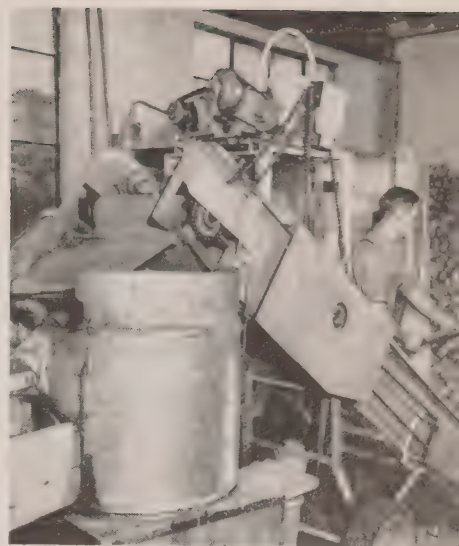
Mr. Neff, in a recent interview with *Ontario Hydro News*, said that the firm is considering the installation of an electric conveyor system to deliver the finished chips straight to the bagging room, thus eliminating the single hand operation.

This young business man has strong convictions about two aspects of the potato chip business. First,

he feels that the potato chip will graduate from a snack to an essential food item in the near future.

As he explained, potato chips do not contain the same ingredients found in the parent vegetable. The ubiquitous spud is 75 per cent water, and water is virtually eliminated by the frying process. Much of the residual starch is squeezed out in the washing, peeling and slicing processes, which should be good news for those who keep one eye on the waistline. He is convinced, too, that this ultimate ambition for the status of the once-lowly chip would not be possible without the economy and efficiency of electricity. Some 50 electric motors, ranging in size from one-quarter to five horsepower, are used in the various processes at the Hostess plant, and he is high in his praise of the service he receives from Ontario Hydro and the staff of Kitchener R.O.A.

"We are chipping away at the market," he said with a smile. "I hope it won't be long before we have a larger slice of it." ■



△  
THIS electric conveyor delivers the potatoes to the peeling and washing machines.



△  
CRISP AND BROWN, the potato chips emerge from one of two large electric frying pans, which produce some 900 lbs. of chips an hour.



△  
FALLING into baskets, the chips are taken to the packaging room where they are automatically bagged and sealed by electrically-operated machines.

# SALUTE FROM LONDON

TO THE citizens of London and southwestern Ontario, historic Western Fair, which had its beginning in 1867—the same year Canada itself was born—means a great deal more than floss candy, carousels and happy crowds. The leadership this area enjoys in agriculture and industry finds expression in the Western Fair so that its continuing expansion reflects the economic accomplishments of the people themselves.

This year the fair had a distinctly Hydro flavor. Hon. W. K. Warrender, Q.C., Vice-Chairman of Ontario Hydro and acting Minister of Municipal Affairs, was accorded the honor of officially opening the large exhibition. In addition, District 7 O.M.E.A. sponsored extensive exhibits skilfully portraying the march of electrical progress. For this purpose, 108 feet of display frontage was donated by fair officials. A unit of the Adam Beck Circus — a familiar sight in the London district more than 40 years ago — drew admiring throngs to hear the story of its role in demonstrating the benefits of electricity in the rural areas of Ontario.

Considering its significance and the high place the Western Fair holds in the affection of the people, these tributes will long be cherished by Ontario Hydro as highlights of its Golden Jubilee celebrations.

At the opening ceremonies, Mr. Warrender drew a warm round of applause with his informative yet

of Ontario Hydro operations, being the home of the Western Region office and closely-associated with Sir Adam Beck — one-time mayor of London, a former member of the Board of Directors of the Western Fair and the first Chairman of Ontario Hydro. The E. V. Buchanan Transformer Station, "named for one of your most respected citizens and Hydro pioneers" was cited as a further link in the chain of mutual interests.

## Recalls Sir Adam Beck

E. V. Buchanan, former General Manager of London P.U.C., who introduced Mr. Warrender, recalled some of the personal impressions he had gained of Sir Adam Beck during his entertaining address during which he recalled memories of former fairs. He also described the remarkable background of common interests shared by the Western Fair, the City of London and Ontario Hydro. As far back as 1911 and 1912, Adam Beck and a group of Hydro engineers set up booths at the fair and demonstrated before thousands of amazed onlookers the advantages of electricity at home and on the farm, he stated.

As proof of Hydro's enduring interest in the London exhibition, Mr. Warrender pointed to the July-August issue of *Ontario Hydro News*, which carried a page-wide photograph of the large Hydro booth located under the grandstand during the 1912 fair. London was described as one of the "focal points"

ing the early years of his long Hydro career. He was introduced by T. O. Robinson, President of the Western Fair, as "our own Mr. Hydro."

Emphasizing Ontario Hydro's Golden Jubilee slogan "A Half Century of Progress to the People," the District 7 O.M.E.A. exhibits made their point by sheer contrast. In order that the public might be aware of the many advantages of today's electrical living, the home interiors of 1906 were portrayed side by side with the functional *décor* of the modern home.

The first two booths compared the parlor of 50 years ago with the family room of today. For maximum effect no effort was spared to reproduce the early interior in every authentic detail, including a copy of a 1906 newspaper on an ornate table of the day. Other props included a melodian, complete with music "roll," and in working condition; trumpet-horn gramophone; hand-operated vacuum cleaner; 1906 space-heater and a genuine, but extremely uncomfortable horsehair sofa. By comparison, the 1956 counterpart of this room was the epitome of comfort, equipped with more than a dozen electrical aids to modern living, including the latest in television, "hi-fi" and motion picture projection equipment.

The same theme of the old and the new was continued in the kitchen. Here again a half-century separated the two rooms whose appointments were well-calculated to





AS FAR back as 1912, Ontario Hydro was telling the story of electricity through the medium of exhibits and demonstrations at the Western Fair. Here Harold Hillier, Hydro Information Officer, is using a model to explain features of the St. Lawrence Power Project to an interested group of youngsters.

remind the housewife of the ever-increasing benefits of electricity.

### Personal Possessions

A fifth booth featured a collection of Sir Adam Beck's most treasured personal possessions — some representing milestones in his life as a public servant and others more indicative of the less formal side of his character. In the same booth, "The History of Light," was traced by a fascinating array of lamps dating from 300 A.D. and running the gamut from the primitive nut-oil burners to the most advanced type of electrical fixture. A brief message describing the function and organization of the O.M.E.A. and aerial views of the Hydro municipalities in western Ontario made up a panel completing this section of the exhibit.

The displays were planned by a committee headed by J. Stewart Killingsworth, Chairman, London P.U.C., and President of District 7 O.M.E.A., and R. M. Laurie, Manager of Hydro's Western Region. Much of the actual assembly was carried out under the direction of John I. Chute and Norman Vaile of the Western Region Office, who gratefully acknowledged the invaluable assistance of the London and Middlesex Historical Society in obtaining authentic furnishings.

Adjacent to the O.M.E.A. displays and adding to the Hydro showing in this section of the Confederation Building, were two booths sponsored

*(Continued on page 28)*

E. V. BUCHANAN, retired General Manager of London P.U.C. and a personal friend of Sir Adam Beck, applies the brakes on a demonstration truck used in the Hydro Chairman's "circuit" in 1912. His passenger is Hon. W. K. Warrender, Hydro Vice-Chairman, while looking on, (left to right) are: Mayor Ray Dennis, London; T. O. Robinson, President, Western Fair Association, and R. M. Laurie, Manager, Ontario Hydro's Western Region.



AS A tribute to Hydro's Golden Jubilee celebrations, District 7 O.M.E.A. sponsored three attractive booths at the Western Fair this year. The central booth, shown here, containing mementoes of the career of Sir Adam Beck, was flanked on either side by authentically-furnished rooms contrasting the kitchen and parlor of 1906 with their modern counterparts.



THERE are still a few things you can do with a penny—even in these days of soaring expenses. Record crowds were drawn to the London P.U.C. booth at this year's Western Fair where they learned that one cent's worth of electric energy, in terms of appliance operation, is still a good buy. Alex Kemp (right) is proving the point to these visitors.



# Outstanding Citizen

**A**MID such tributes as "one of the best engineers I have known," and "an outstanding St. Thomas citizen," J. Walton Peart retired recently from the post of General Manager of St. Thomas Public Utilities Commission.

Mr. Peart's retirement marked the conclusion of 43 years' service in the Ontario utility field, 30 of which were spent in charge of the St. Thomas system. In recognition of his intimate knowledge of utility operations in that city, he has been retained in an advisory capacity for a period of a year.

Born at Brantford in 1891, he received his primary and secondary education at Welland and St. Thomas, graduating from the University of Toronto (Faculty of Electrical Engineering) in 1913. After a brief training course with the Canadian Westinghouse Company, he joined the staff of the London Public Utilities Commission under E. V. Buchanan in the same year. Mr. Peart remained with the London utility, except for a period of overseas service with the Canadian Field Artillery (1916-1919), until 1926 when he was appointed Manager of St. Thomas Hydro-Electric Commission in July that year. In 1935 a public utilities commission was established to administer Hydro, gas and water services in the city, and Mr. Peart was named to the post of General Manager.

His lengthy career in this field of public service was symbolized by the presence of a large group of Ontario Hydro and municipal Hydro representatives, engineering colleagues, civic officials and representatives of the various depart-



△  
CHATting with his successor, W. J. Underhill, right, the retiring General Manager, J. W. Peart, holds the pipe presented to him by President E. A. Washburn on behalf of the A.M.E.U. The certificate in the foreground was presented on behalf of the City of St. Thomas as a token of 30 years' civic service.

ments of St. Thomas P.U.C. at a complimentary dinner on September 7 this year.

Flanking Mr. Peart at the head table were members of the St. Thomas Commission including Chairman R. T. Gilbert, Mayor Peter Laing, and Commissioners P. R. Locke, William Allan and George D. Lang.

Representing the utility staff were the new General Manager, W. J. Underhill, Frank Ford, Assistant General Manager; Bert Caskey, Treasurer; Herbert Aitken, H. A. Mailing, Lorne McVicar, Allan Littlejohn and Joseph Skelding.

## Long-Service Certificate

Symbolizing the esteem in which Mr. Peart was held by his St.

Thomas colleagues was the presentation of a long-service certificate on behalf of the City of St. Thomas. The long-service certificate was presented by Col. William Green, who was instrumental in securing Mr. Peart's services three decades ago. Sharing this pleasant duty with Col. Green were two other long-service commissioners, Ernest Seger and Mr. Locke. On behalf of St. Thomas P.U.C., Mayor Laing presented the retiring utility executive with a handsome leather brief-case.

Indicating Mr. Peart's long and distinguished association with the A.M.E.U. (with which he served in various capacities, including the presidency in 1931), President E. A. Washburn made the presentation of a pipe.

With Chairman R. T. Gilbert as Master of Ceremonies, Mr. Locke assumed the duty of introducing several speakers, all of whom were unanimous in voicing commendation of Mr. Peart's role in the growth of the municipal Hydro systems and his contribution to civic progress at St. Thomas.

Among those paying tribute to the retiring executive was his former London "boss," E. V. Buchanan, retired General Manager of London P.U.C. Describing him as "one of the best engineers I have known," Mr. Buchanan recalled Mr. Peart's early association with the London utility.

Referring to his career with the St. Thomas Commission, Mr. Buchanan said "it is possible that the people of St. Thomas are not fully aware of his loyalty, conscientiousness and outstanding ability."

Representing Ontario Hydro, Vice-Chairman W. Ross Strike said



that the successful growth of the Hydro systems was due, in great measure, to the excellent work of local utility managers such as Mr. Peart.

### Suitable Replacements

Mr. Peart's retirement, Mr. Strike stated, emphasized the urgent necessity of providing suitable replacements for those who are retiring from the field of utility management.

"This is an area for the combined attention of us all," the speaker stressed. "Perhaps we should make a start in our universities where special courses could be given for those who demonstrate a talent for this type of work."

Also representing Ontario Hydro, R. M. Laurie, Manager, Western Region, said "it is sad to see the old guard move out." Mentioning the difficult problems that frequently confront utility managers, Mr. Laurie expressed the conviction that the complimentary dinner represented, at least, partial payment to Mr. Peart "for a job well done."

In presenting a leather brief-case on behalf of the St. Thomas Commission, Mayor Laing referred to Mr. Peart as an outstanding citizen, who had given considerable time and leadership in the completion of important civic projects.

"We gratefully remember the zeal with which he participated in building our hospital and the campaign for erection of the St. Thomas arena. We can recall, too, his long association with the St. Thomas Kiwanis Club and his interest in musical activities."

Brief addresses by Gordon H. Fuller, O.M.E.A. President; W. R. Mathieson, Secretary - Treasurer, A.M.E.U.; R. S. Reynolds, General Manager, Chatham P.U.C.; Mr. Underhill, successor to Mr. Peart, and other P.U.C. staff members, lauded the role of Mr. Peart in the many fields of activity with which he had been identified.

In responding to these numerous

and glowing eulogies, Mr. Peart said that he was conscious of the fact that his career had covered a period of broad development — "a period in which we have emerged from the horse-and-buggy era and now stand on the threshold of the atomic age."

Tracing the growth of the St. Thomas utility during his long period of service, Mr. Peart recorded his appreciation of the loyal staff members and of the valuable assistance provided by members of past commissions "in formulating sound policies."

"As I step down from active service I still look with confidence to the future and have great expectations for an interesting retirement."

### New General Manager

Succeeding Mr. Peart as General Manager, William J. Underhill was born at St. Thomas in 1921. After completing primary and secondary education in that city, he graduated in electrical engineering from Queen's University in 1949. He joined the St. Thomas P.U.C. staff that year as Assistant Engineer. Last

year he was named Assistant General Manager, which position he held until his latest appointment.

Married with three children, Mr. Underhill also obtained his Bachelor of Arts degree from Queen's University last year. While serving overseas with the R.C.A.F. during the Second World War, the young utility executive was awarded the Distinguished Flying Cross.

Active in engineering circles, he is a member of the Association of Professional Engineers of Ontario and the Engineering Institute of Canada. He is also a member of the St. Thomas Rotary Club.

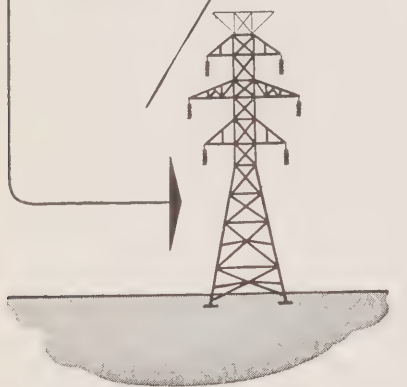
Serving with Mr. Underhill as Assistant General Manager will be Frank Ford, a member of the St. Thomas staff for 27 years.

Mr. Ford became associated with the commission in 1929 as a draftsman and has also been identified with the records department in the interim. In addition to Mr. Ford's recent appointment, Bert Caskey, former office manager, has been named commission treasurer. ■

MEMBERS of the St. Thomas Commission, back row, left to right: George D. Lang, W. A. Allan, Chairman R. T. Gilbert and P. R. Locke, echo the best wishes of Mayor Peter Laing, left, as he presents the retiring utility executive with a handsome, leather brief case.



# ALONG HYDRO LINES



## Long Sault Rapids Being Eliminated

Taming of the famed Long Sault Rapids commenced on September 10 when a skip pan dumped the first of tens of thousands of tons of rock into the north channel of the St. Lawrence River. Engineers while declining to estimate how long it will take to eliminate the rapids, predict it will be a slow death for the Long Sault.

### DISTRICT 4 O.M.E.A. ANNUAL MEETING

D. G. Moffitt, Secretary-Treasurer, District 4 O.M.E.A., has advised that the annual meeting of the association will be held at the King Edward Hotel, Toronto, November 29, 1956. Registration will commence at 1.00 p.m. in the Fountain Court room, and the business session will convene promptly at 2.00 p.m.

Dinner will be served in the Sheraton Room following the business session. President Bert Merson has asked for a full and prompt attendance as important matters are on the agenda.

## Riverside Building Program

Riverside P.U.C. is engaged in an \$18,000 expansion program, Chairman Edmund Cecile has announced. The program includes construction of a new warehouse, extension of garage facilities and renovations to the commission's office building, as well as purchase of adjacent property as a site for the warehouse.

## Durham Commission Names Superintendent

James Flewelling, a member of the staff for several years, has been appointed Superintendent in charge of the Hydro division of Durham P.U.C., while William McDonald has been appointed Secretary. They are replacing David Rolston and Jack McCreight, who have resigned to take up duties with Strathroy P.U.C. Mr. Rolston has been named Manager at Strathroy, while Mr. McCreight becomes office manager. They are filling the vacancies left by the recent retirement of A. E. Ditchburn and the resignation of Richard Brown.

## Predicts 25,000,000-Ton Canal Traffic Increase

Officiating at the laying of a cornerstone for the new headquarters of the St. Lawrence Seaway Authority on September 11, Hon. Lionel Chevrier, Authority President, predicted that traffic passing through the Ontario St. Lawrence Canals after completion of the seaway development would increase to approximately 35,000,000 tons a year. Today's shipping totals approximately 10,000,000 tons a year.

## Kitchener to Honor Former Commissioners

Kitchener substations are to be named in honor of former commissioners in recognition of their services to the city. The plan was recently inaugurated by the Kitchener utility on the suggestion of Commissioner Bruce Weber. Bronze plaques bearing the commissioners' names will be placed on the entrance to each of the city's 12 or more substations.

## LINK ONTARIO HYDRO-MANITOBA SYSTEMS

**I**NTERCONNECTION of Ontario Hydro's Northwestern Division System and the connected transmission systems of The Manitoba Hydro-Electric Board and the City of Winnipeg Hydro-Electric System was announced recently by Ontario Prime Minister, Hon. L. M. Frost.

An agreement, which took effect on October 1 this year, between Ontario Hydro and the Manitoba Board, provides, among other things, for the sale by the Manitoba utility to the Commission of a 32.6-mile Ontario section of transmission line. This line presently extends from the Seven Sisters Generating Station in Manitoba (some 50 miles east of Winnipeg) to the Town of Kenora. Ontario Hydro is building a transmission line from Dryden to Kenora

in Ontario, which, together with the proposed interconnection, will permit power transfers to be effected between Ontario Hydro's entire Northwestern Division (extending from the Nipigon area westerly to the Ontario-Manitoba boundary) and the power systems of Manitoba.

Engineers of the two utilities, who have been working on this problem for the past seven years, point out that the interconnecting facilities will permit each of the large power systems to render assistance to the other in times of emergency. In addition, the tie-in will enable the Ontario Hydro and Manitoba power systems to make the greatest possible use of the flows available in the English and Winnipeg River watersheds.



## WILL ENLARGE TORONTO STATION

**H**YDRO's Richard L. Hearn Generating Station in Toronto — the largest thermal-electric plant in Canada — is to be expanded to accommodate two additional units. This extension will raise the total capacity of the station, which was officially opened in 1951, to one million kilowatts.

At the present time, four 100,000-kilowatt units are installed and a fifth 200,000-kilowatt unit, announced early this year, is scheduled for service in the fall of 1958.

Orders for the turbo-generator sets have been placed with C. A. Parsons and Company Limited and for the boilers with Combustion Engineering-Superheater Limited. The first of the newly-authorized units is scheduled for service in October, 1959, and the second a year later, with the provision that, at the option of Ontario Hydro, the in-service

date of the second unit may be deferred one year.

Chairman Dr. Richard L. Hearn, for whom the station is named, stated recently that the increasing rate of power demands has made provision for additional generating capacity imperative.

For many years power demands of the Southern Ontario System grew at an equivalent rate of about six per cent a year. More recently, however, this rate has increased and during June was more than 11 per cent in excess of demands experienced in the same month last year. A similar situation existed during July and August, and in order to maintain an adequate reserve capacity in 1959, the sixth unit for the Toronto thermal-electric plant has been authorized, along with the seventh unit to be available in 1960 or 1961.

### Substations Honor Former Commissioners

Service of two former Brockville P.U.C. Commissioners is to be commemorated by naming two Hydro substations in their honor.

The Dr. Thomas F. Robertson Substation No. 1 will honor the late Dr. Robertson, who served continuously from 1922 to 1940, while the Harry S. Brown Substation No. 2, will pay tribute to this commissioner, now in his nineties, who retired in 1950 after 29 years' continuous service.

### Port Arthur Raises Staff Pensions

Basic pensions of Port Arthur P.U.C. staff have been increased from \$50 to \$60 monthly, effective September 1, in accordance with a resolution approved at a recent commission meeting.

### Name Parry Sound R.O.A. Manager

Assistant to the Manager of the Walkerton Rural Operating Area for the past four years, W. R. Martin has been appointed Manager of the Parry Sound R.O.A.

### Stratford P.U.C. Plans New Garage

Stratford P.U.C. has authorized a sub-committee to call tenders for a new garage as soon as plans have been approved by Ontario Hydro. The garage, estimated to cost approximately \$140,000, is part of a utility expansion program, which includes eventual construction of a new office building on property presently owned by the local commission. Recently Stratford commissioners authorized an option on a nearby building to allow for future expansion.

### Announce Project Personnel Appointments

Three important personnel appointments at Ontario Hydro's Whitedog-Caribou project in north-western Ontario were recently announced by J. E. Stark, the Commission's Director of Construction. Although separate developments (the Whitedog project being situated on the Winnipeg River and the Caribou project on the English River), it has been found feasible to place them under a joint field engineering team due to their comparative proximity. Designed to promote more effective co-ordination of engineering and construction forces, the new appointments include W. M. Reynolds, Generation Department-Engineering Division, as Field Project Engineer and H. C. Jones as General Superintendent of the Whitedog-Caribou project. Lately, Mr. Jones has been serving in the capacity of Construction Superintendent of the Whitedog Falls development. S. G. Hummel, who has been Transport and Work Equipment Manager at the A. W. Manby Service Centre, Islington, Ont., has been appointed Woods Operation Manager of the joint northern project effective September 1.

## HISTORY OF NUCLEAR POWER

*(Continued from page 6)*

for the production of electric energy. By contributing engineers to the team engaged in these studies, Ontario Hydro took its first decisive step into the field of nuclear-electric power . . . a step which led directly to the appointment of Ontario Hydro as one of the participants in "NPD."

When "NPD" comes into operation in 1959, Canada will have joined the ranks of the first nations to employ nuclear-electric power for the betterment of their people, the furtherance of their industries and the elevation of their own economic status. ■



### TURN SOD FOR NEW SERVICE BUILDING

**R**EFLECTING the continuing expansion of its electrical system, Windsor Utilities Commission recently turned the first sod for its new Hydro Division service building. The new structure will be approximately 140 x 360 feet with the front portion being two storeys and the garage and storage section one storey in height. The Windsor Commission recently opened its new office building (Ontario Hydro News, June, 1956) and the completion of the service building early in 1957 will conclude the present major building program. Attending the ground-breaking ceremony were (left to right): Charles Gress, Granite Construction Company, which has the \$623,000 contract for the building; M. J. Brian, Chairman, Windsor U.C.; H. C. Paillefer, Commissioner; K. McWhinnie, Architect; J. E. Teckoe, Jr., General Manager; D. Johnson, Architect; Gordon H. Fuller, Windsor Commissioner and O.M.E.A. President, and Alderman M. Belanger, Windsor.

### PLAN CHANGEOVER AT BRANTFORD

**L**ISTINGS are now being made of frequency-sensitive appliances owned by customers of the Brantford Public Utilities Commission in preparation for Ontario Hydro's frequency standardization program in the city, which is scheduled to commence in February, 1957.

Since 1953, the Brantford Commission has converted the electrical supply and equipment of some 5,000 customers in the city under an advance standardization program, arranged in co-operation with Ontario Hydro.

During the period of general changeover, from the first week of April, 1957 to the middle of July, 1957, the remaining domestic, commercial and power customers in Brantford—estimated at some 11,000—still operating their equipment at 25 cycles, will have their homes, business premises or industrial plants converted for 60-cycle operation.

### LOAD GROWTH FACTS

(Continued from page 9)

sorbing question-and-answer period, during which many delegates offered views and took part in discussions on such subjects as rate setting, commission employee wages and meter deposits.

The delegates honored Mr. Kennedy by unanimously naming him association president for the coming year. Election of all other officers also was unanimous, these being: Past President C. J. Halliday, Chesley; First Vice-President A. T. Smith, North Bay; Second Vice-President John M. Low, Uxbridge; Secretary-Treasurer Robert Butter, Owen Sound; Directors: V. A. Ellis, Collingwood; L. A. Landreville, Sudbury; Harry Thiess, Orillia; Robert Watson, Holstein; Charles Parker, Midland; Edwin H. Faelker, Hanover, and William Booker, Meaford. — by Gary Smith.

### MAPS, MODELS AND MURALS

(Continued from page 13)

former boxes and sagging transmission lines; the latter depicted the improved effect with overhead lines replaced by underground cables, transformers buried beneath the sidewalk in vaults, wooden poles removed altogether and special facade lighting mounted on the sides of stores and office buildings.

Great care was taken to make the overall décor of the Toronto Hydro display as restful as possible, with discreet lighting, comfortable chairs for tired visitors and tasteful wall decorations, including an illuminated display centred on the Hydro Golden Jubilee motif.

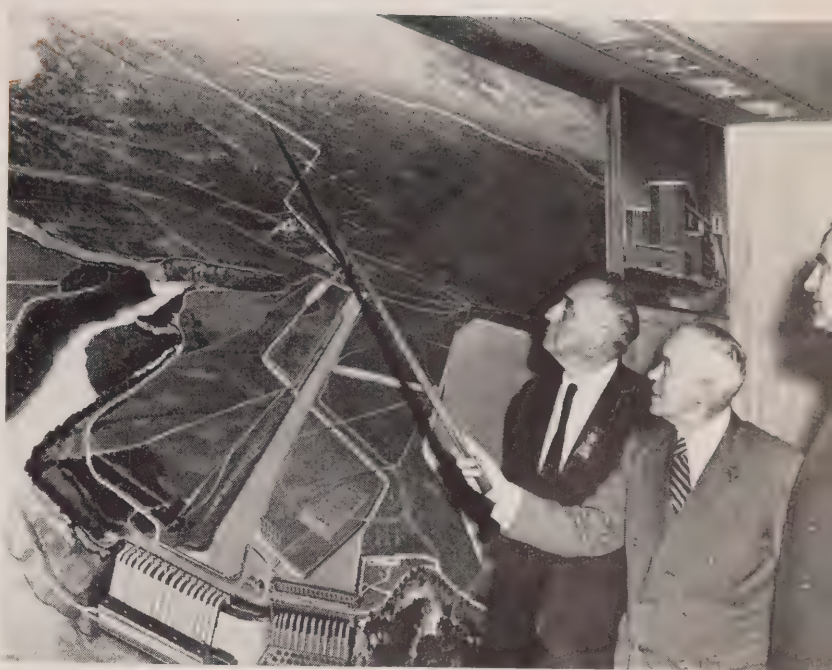
### SALUTE FROW LONDON

(Continued from page 23)

by Ontario Hydro. Shown here were detailed models of the St. Lawrence Power Project and a typical nuclear-electric generating station, which were also on display at Toronto's C.N.E. The London P.U.C. booth demonstrated what a cent's worth of electricity would do for the average Hydro customer. — by Don Wright.



**NEW YORK GUESTS** - High-ranking representatives of New York State, including Governor Averell Harriman and Chairman Robert Moses, Power Authority of the State of New York, were guests of Ontario Hydro recently when they inspected the Commission's Sir Adam Beck-Niagara Generating Station No. 2 project. Dr. Otto Holden, Hydro's Chief Engineer, is shown with Mr. Moses (left) and Governor Harriman as he described details of the adjacent Sir Adam Beck No. 1 and No. 2 developments near Niagara Falls as depicted in this large painting. Dr. Holden was one of the guest speakers at a dinner in Niagara Falls, Ont., when proposed plans for development of parks, hydro-electric power and highways on the U.S. side of the Niagara River were announced by Mr. Moses.



**ST. LAWRENCE VISITORS** - On a tour of important eastern Ontario points of interest, during which they inspected Hydro's 372,000-kilowatt Des Joachim's Generating Station on the Ottawa River and attended the official sod-turning ceremonies at the nearby site of Canada's first nuclear-electric station (see page 2), some 250 members of the Toronto Board of Trade also inspected progress of the St. Lawrence Power Project. Here Hydro's Chief Engineer Dr. Otto Holden points to the construction of the Commission's St. Lawrence powerhouse with four members of the visiting party, left to right: G. H. Sheppard, A. J. Little, Board of Trade President; John Ellis, Vice-President; James Wakelin, General Manager, and Gordon Mitchell, Director, St. Lawrence Power Project.







**U**NIVERSITY Avenue, now regarded as Toronto's "show street," was known as College Avenue in 1888. The inset view on this page, made available by the Canada Life Assurance Co., shows the chestnut trees, which flanked the quiet street in those days. Since the establishment of Hydro's Head Office in 1916 (the present 18-storey structure is designated in the accompanying R.C.A.F. aerial photograph) many changes have taken place. Several impressive buildings have replaced the chestnut trees and homes, while the thoroughfare has been widened and extended in the intervening years. (See "Sermon in Stone" — page 14 of this issue — for further references to University Ave. and the history of the Commission's Head Office.)





ONTARIO HYDRO

# News

NOVEMBER, 1956

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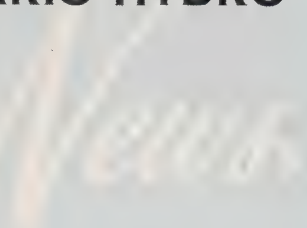
UNIVERSITY OF TORONTO

WHITEDOG CONSTRUCTION

NOVEMBER, 1956

VOLUME 43, NUMBER 11

# ONTARIO HYDRO



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## INTERNATIONAL GOODWILL

AN OLD Roman proverb asserts that "we are interested in others when they are interested in us." Conceivably that might have been the feeling of two organizations, which recently sponsored a celebration at Cornwall in honor of Ontario Hydro's 50th anniversary.

Significantly enough it was the first international observance of the Hydro Golden Jubilee and the joint hosts at this event were Zones 2 and 3 of the Eastern Ontario Development Association and a parallel U.S. organization, the St. Lawrence Valley Associated Chambers of Commerce.

It is understandable that a Canadian, and particularly an eastern Ontario organization, should have seen fit to pay tribute to the Commission in view of its participation in the St. Lawrence Seaway and Power Project. There seems to be general agreement that both phases of the project will contribute generously to a new level of prosperity in the eastern section of the province. Focusing scrutiny on the problems of power supply and demand, which "Ontario Hydro is facing with characteristic energy," the *Ottawa Evening Journal* recently stated that "there is no better criterion of the industrial and social expansion of this province than is found in the demand for electric power."

Thus, while it is refreshing and gratifying to receive a 50th anniversary salute from the Eastern Ontario Development Association, it is particularly noteworthy to find a sister international organization participating in the event.

Representatives of New York State, the Power Authority of the State of New York and the Niagara-Mohawk Power Corporation also voiced praise of the Commission on this occasion. A report in the *Cornwall Standard Freeholder* indicates that these messages "lauded the initiative, progressiveness and splendid co-operation evidenced by Hydro in its dealings with U.S. interests."

Such explicit expressions of amity and goodwill from friendly neighbors are indeed heartening in these days of serious international tension.

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## COVER SHOTS

SALUTING construction crews in northern Ontario, our front cover this month depicts five diversion sluices at Hydro's Whitedog Falls project on the Winnipeg River. The recent completion of these sluiceway structures has permitted diversion of the river from its normal course, enabling crews to proceed with powerhouse and main dam excavation work.

The back cover, in keeping with the Hydro Golden Jubilee theme, compares domestic electrical appliances of 1956 with those available in Toronto some four decades ago.



# JAMES S. DUNCAN, C.M.G. NAMED HYDRO CHAIRMAN

Prime Minister Leslie M. Frost also announces appointments of  
Hon. Ray Connell and D. P. Cliff to the Ontario Hydro Commission

**A**N EMINENT Canadian industrialist, James S. Duncan, C.M.G., assumed office on November 1, 1956, as Ontario Hydro's eighth Chairman.

In announcing the appointment of Mr. Duncan to succeed Dr. Richard L. Hearn, who officially resigned from the chairmanship on October 31, Ontario's Prime Minister, the Hon. Leslie M. Frost, expressed gratification that Dr. Hearn, as an engineering consultant, would continue his long association with the Commission, while remaining as a Director of Atomic Energy of Canada Limited.

At the same time, Hon. William K. Warrender, Q.C., former Minister without portfolio and Hydro Vice-Chairman, became Minister of Municipal Affairs in the Ontario Government. Mr. Warrender, Minister of Planning and Development before his appointment to the Hydro post in 1955, has been acting Minister of Municipal Affairs since August this year.

Mr. Frost also confirmed the appointment of W. Ross Strike, Q.C., as Hydro's First Vice-Chairman. Replacing Mr. Warrender on the Commission, Hon. Ray Connell (M.P.P., Hamilton-Wentworth) was named Minister without portfolio and Second Vice-Chairman of Ontario Hydro. Further emphasizing the relationship between the Commission and the Ontario Municipal Electric Association was the appointment of David P. Cliff, Dundas, as a Commissioner. Mr. Cliff is a former President of the O.M.E.A., and in recent years has been serving as the association's Secretary-Trea-



NEW members of the Commission (left to right): D. P. Cliff, Commissioner; Chairman James S. Duncan and Hon. Ray Connell, Second Vice-Chairman, posed for this official photograph after taking the oath of office in the Lieutenant-Governor's suite at Queen's Park on Nov. 1.

surer. Another former O.M.E.A. President, Lt.-Col. A. A. Kennedy, D.S.O., E.D., continues as a Commissioner.

## James S. Duncan

Mr. Duncan assumes the chairmanship of the Commission with a distinguished background in industry, business and public service.

Born and educated in Paris, France, Mr. Duncan joined the Massey-Harris Co. Ltd., in Berlin, Germany, in 1910. He came to Canada in 1911 and worked in the Toronto plant. At the outbreak of the First World War in 1914 he returned to France and shortly thereafter enlisted with the Royal Field Artillery. He gained promotion to the rank of captain and was awarded a Mention in Despatches.

After demobilization he rejoined Massey-Harris in 1919, representing the company in several senior capa-

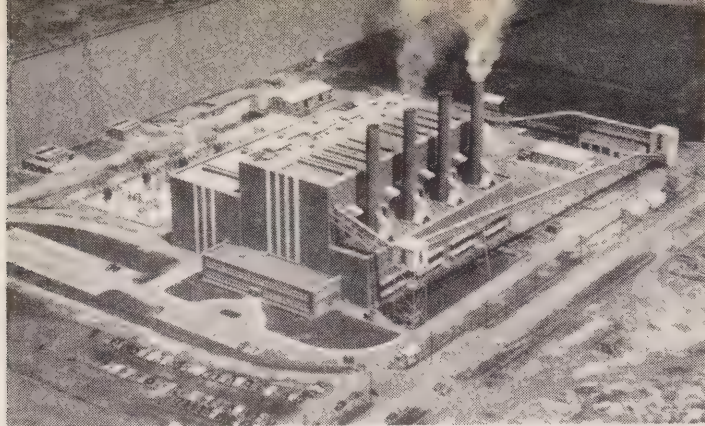
cities in Europe, North Africa and Argentina. In 1935 he was recalled to the Head Office in Toronto as General Sales Manager, being appointed General Manager in 1936. His executive abilities were recognized in 1941 by his election to the presidency of Massey-Harris, and in 1949 he became both Chairman and President. In these capacities he guided the company through a challenging period of expansion. He relinquished his association with the internationally-recognized farm implement and machinery firm in July this year.

His contributions in the industrial and business field have been coupled with a noteworthy participation in public service.

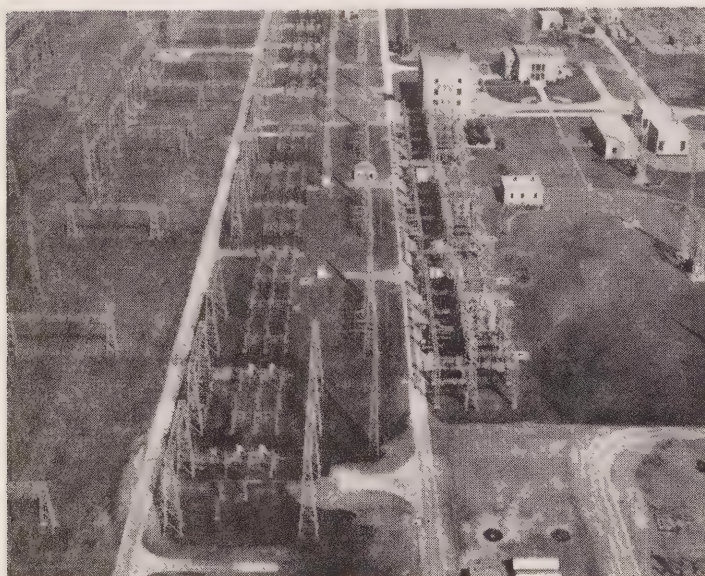
As Deputy Minister for Air Canadian Department of National Defence) he helped to organize the

*(Continued on page 22)*





RICHARD L. HEARN GENERATING STATION, TORONTO.



BURLINGTON TRANSFORMER STATION NEAR HAMILTON.

## **Richard L. Hearn Generating Station in Toronto and Burlington Transformer Station near Hamilton opened to public for Golden Jubilee inspection tours**

Dr. Hearn, in whose honor the important station was named, greeted the visitors during a pre-tour briefing held in a tent outside the plant. In a short address he described the events leading up to Hydro's decision to build the large plant, and the significant part it had played as an integral link in the Hydro system.

Work was begun on the station, Dr. Hearn told his audience, in the spring of 1949 after it was realized that load growth was continuing at a rapid pace. This station, along with the J. Clark Keith thermal-electric plant at Windsor, was authorized to overcome expected deficiencies prior to 1954 and after that time to provide a balance between hydraulic and thermal resources in the Southern Ontario System.

### **Two Units Planned**

"At first only two units were planned, one unit rated at 88,000 kilowatts at 25 cycles to take care of the high rate of load growth at that frequency, and the other unit with a capacity of 100,000 kilowatts to operate at 60 cycles.

"CONVENTIONAL thermal generating stations will play an increasingly important part in the Commission's future expansion plans. They will serve, first as a safeguard to our system and, second, as the major source of generation after all the available economic sources of hydraulic power have been developed."

The foregoing statement was one of the highlights of an address by former Hydro Chairman Dr. Richard L. Hearn at a recent ceremony inaugurating a series of "open house" tours of the Commission's Richard L. Hearn Generating Station in Toronto.

More than 150 guests, represent-

ing Hydro utilities in the Toronto Region, as well as the O.M.E.A., A.M.E.U. and Toronto industrial firms, participated in the initial inspection visit to Canada's largest thermal-electric plant on October 9.

Guests were later conducted through the station and shown various phases of the plant's operation, as well as some of its unique features. The two-week Open House, one of many held this year at Hydro installations to commemorate Hydro's Golden Jubilee year, provided an opportunity for organized groups from municipalities in the Toronto area to see this important link in Hydro's generating system.



# HOUSE" TOURS

"By the fall of 1950," Dr. Hearn continued, "a particularly heavy defence program and heavy customer demand . . . made it necessary to revise our plans. The decision was to double the capacity of the Toronto station by adding one 25-cycle and one 60-cycle unit."

Today, the speaker said, new plans called for further extensive additions to the plant to give the station an ultimate installed capacity of one million kilowatts—"180,000 kilowatts more than Hydro's share from the St. Lawrence Power Project."

Also on hand were W. Ross Strike, Q.C., First Vice-Chairman, Lt.-Col. A. A. Kennedy, Commissioner, and A. W. Manby, General Manager, Ontario Hydro. Adam Smith, Manager of the Toronto Region, acted as master-of-ceremonies, introducing and thanking Dr. Hearn, Mr. Manby and several other speakers, and also extending a welcome to the visitors.

In describing how Hydro must meet an ever-increasing demand for power, Mr. Manby told visitors that the Commission may have to step up its expansion program. "The load growth in the last few years has been absolutely fantastic," he said.

The most startling growth, Mr. Manby continued, had been in the last year, especially in recent months. In past weeks the demand for power had been increasing at the rate of between eight and ten per cent over the corresponding period last year. "We're facing a situation where our load is doubling every 10 or 11 years and possibly in even a shorter time."

Mr. Manby said plans made five years ago to meet the demand for electricity were already out of date.



◁ ADAM Smith, Manager of Hydro's Toronto Region, presided at the ceremony inaugurating the "open house" tours of the station.

"It would not surprise me if our present plans are proved inadequate before 1961. We well may have to step out and do more than we plan to even now."

Mr. Smith also called on Bert Merson, Chairman, Toronto Electric Commissioners, and President, District 4, O.M.E.A., and A. "Scotty" Hamilton, Superintendent, Forest Hill Hydro System, and President, Toronto Region, A.M.E.U., to speak on behalf of their associations.

Prior to the inspection of the plant, the visitors heard Superintendent E. D. Holdup describe the operation of the station. Mr. Holdup, using a cutaway sectional drawing of the building, demonstrated the sequence of power generation, from the time the coal enters the furnace bunkers to the point at which the live steam turns the turbo-generators. The guests were then taken to the seventh floor, and from this point conducted downward through the plant while the various features were pointed out. Following the tour a buffet luncheon was served in the tent.

—by Gary Smith.

SUPERINTENDENT E. D. Holdup, with the aid of this cutaway sectional drawing of a thermal-electric plant, described the sequence of power generation preceding the first tour.



△ AYLMER Rice, operator (left), one of several station employees acting as guides during the "open house" tours of the Richard L. Hearn station, pauses with a group beside a 100,000-kilowatt generator.

# BURLINGTON OPEN HOUSE



GUESTS at Burlington Transformer Station "open house" saw a demonstration of insulator washing. This ladder is used in spraying insulators with water under 1,200 lbs. pressure.

ONTARIO Hydro also played host to Hydro customers in the Hamilton area by holding a Golden Jubilee "Open House" at its Burlington Transformer Station. This station, a vital power distribution centre in the heart of one of Ontario's most highly-industrialized areas, was open to the public for 13 days, beginning September 26 and continuing through until October 8.

Participating in the brief inaugural ceremony on September 26, Lt.-Col. A. A. Kennedy, Ontario Hydro Commissioner; J. W. Hammond, General Manager, Hamilton Hydro-Electric Commission; D. P. Cliff, Dundas, Secretary-Treasurer, O.M.E.A. (recently appointed an Ontario Hydro Commissioner), and W. A. Whelan, President, Niagara District Electric Club, reviewed the province's phenomenal electrical progress since Ontario Hydro was formed 50 years ago. This ceremony was attended by 145 or more representatives of municipal utilities, civic organizations, industry, press and radio. At its conclusion a buffet luncheon was served in the service building.

O. S. Russell, Manager of Hydro's West Central Region, acted as

master of ceremonies, being assisted in the arrangements for the open house by W. J. Jackson, Operations Engineer; I. S. Stubbs, Consumer Service Engineer; A. E. Chatland, Operating Supervisor (who is also in charge of the station); I. S. MacLean, Regional Accountant; C. W. Bishop, Security Officer, and representatives of Hydro's Information Division.

During the "Open House" period, Burlington Transformer Station was open to the public each weekday, from 9.30 a.m. until 5.00 p.m. On Saturdays, Sundays and holidays, visitors toured the station from 1.00 p.m. until 5.00 p.m. In addition, evening inspections were arranged on October 1, 3 and 5 from 7.00 o'clock to 9.00 o'clock.

Non-technical guests at the "open house," were conducted on a 40-minute tour of the plant by members of the Operating and the Meter and Relay Staffs. They were provided with a description of the station's functions, and then had the opportunity of seeing the operations from a gallery near the control room while important features were explained.

In the control room, guests learned of the safeguards necessary in "stepping down" power from 230,000 to 115,000 volts. The role of oil in this operation was underlined, guides explaining its function in circuit breakers, underground transmission cables and transformers. Visitors learned with interest that 60-cycle transformers cost less to manufacture than 25-cycle transformers.

## Battery-Room

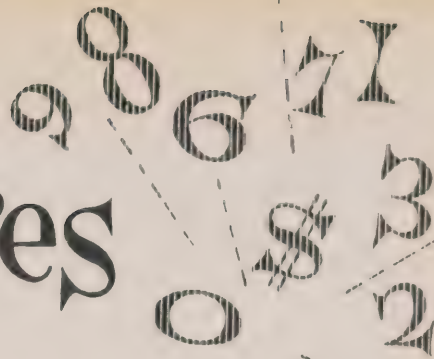
Other interesting demonstrations included the battery-room provided in the event of a complete power failure; a "Chipper," which reduces tree limbs to fine chips; a sky-lift mechanism used for work above ground level, and truck-mounted equipment employed in washing insulators. Following this, Hydro "shareholders" made an exterior inspection. For groups interested in details of a more technical nature, a special two-hour tour was available.

Equalled in size only by the Leaside Transformer Station in the eastern section of Metropolitan Toronto; the A. W. Manby T. S. at Islington, and the E. V. Buchanan T. S. near London, the Burlington station, as a transformer station, serves an area, bounded roughly by Brantford on the west, Guelph on the north and Grimsby on the south. It is also a main switching station connecting Ontario Hydro's plants on the Niagara and Ottawa Rivers. When initial power is delivered from the St. Lawrence in 1958, Burlington will be also tied-in to this development. Thus, it is a key distribution point for high voltage power.

Placed in service in 1941, Burlington T. S. was built to distribute power at 230,000 and 115,000 volts at 25 cycles in the Toronto-Hamilton-London areas. Since the rapid increase in the use of 60-cycle power in that area, through Hydro's frequency standardization program, the station's 455,000-kva capacity has become almost equally divided between 25 and 60 cycles. ■



# Facts and Figures



**Customer deposit discussion features 24th annual Western  
Ontario A.M.E.U. Accounting and Office Administration Conference**

**A**CCOUNTING and customer relations problems were the chief topics of discussion at the 24th annual conference sponsored by the A.M.E.U. Western Ontario Accounting and Office Administration Committee.

Held at Windsor this year, the two-day gathering attracted a heavy registration of some 220 delegates, representing municipal utilities and Ontario Hydro regional staff in western Ontario.

An open discussion on customer relations dealt exhaustively with the question of customer deposits, dis-

closing two schools of thought on this subject.

One group expressed doubt that customer deposits were worthwhile in view of the time and cost involved in recording such transactions and refunding deposits when customers moved. Another group made it equally clear that they not only favored deposits, but deposits on a sliding scale — in accordance with the total of the customer's bill. One delegate reinforced this opinion by pointing out that Hydro customers received two months credit, plus the period

between the mailing of the bill and the discount date. This was in marked contrast, he said, with the practice of other utilities, which, far from allowing credit, billed their customers one month in advance for the service they performed.

One delegate observed that Canadian electrical utilities would not require customer deposits if the same rates were charged as those in force in the United States, as they could afford the risk of a proportion of bad debts.

*(Continued on page 6)*

THESE panel members (left to right): W. G. Woods, Waterloo; Miss Norma E. Crane, Niagara Falls; D. N. Durward, Galt; James Gow, Guelph, and Grant Stickney, Stratford, discussed customer relations.





While a "show of hands" revealed that only two municipalities did not collect deposits, it was indicated that some municipalities modified this procedure by not collecting deposits from home owners. The collective experience of the delegates revealed, however, that even this was not a simple definition, for it posed the question: "Who is the home owner? Is it someone who pays a \$500 deposit and occupies a house, or is it the holder of the mortgage?"

This point, and many others of interest, arose from a discussion on "Collections and Customer Relations" with Conference Chairman David N. Durward, Galt, heading a panel comprising: Miss Norma Crane, Niagara Falls; Grant Stickney, Stratford; W. George Woods, Waterloo, and James Gow, Guelph.

#### Four-Block Rate Structure

Another interesting discussion in connection with the report of the sub-committee on billing concerned "Domestic Four-Block Billing." In this regard John F. Cook, Office

Manager, Windsor Utilities Commission (which has been using the four-block method since the beginning of 1956) was able to dispel any apprehensions delegates might feel toward this innovation.

He said that it had been introduced by Ontario Hydro after many months of study in conjunction with the A.M.E.U. Rates Committee in order to place domestic rates on a more equitable basis. He recalled that more than a year ago he had been requested to undertake a study of this type of billing to ascertain whether it could be instituted without too much difficulty from a mechanical standpoint, as it was essential to avoid any great expenditure on billing machines.

Mr. Cook was able to assure delegates that information obtained from billing machine manufacturers indicated that a great majority of municipalities now had equipment with sufficient capacity to bill on a four-block domestic rate structure.

Remarking that his commission had been on the alert for customer

reaction when it changed to the new system, Mr. Cook stated that there had been no unfavorable criticism.

Mr. Cook's comprehensive study of the theory, implications and practical experience of the four-block rate structure was made available in a seven-page paper, and delegates gratefully took advantage of the offer of copies.

#### Billing Reports

Other informative reports sponsored by the billing sub-committee were made by E. Harry Ellis, Municipal Accountant, Western Region on "Methods of Billing Flat Rate Water Heaters;" by Neil Upshall, Office Manager of Etobicoke Township H.E.C. on "Calculation of Power Bills," and by Robert Gray, Municipal Accountant, Western Region on "Peg Board Billing," these reports being printed and made available to delegates for future reference and closer study.

Turning from bills to records and forms, delegates viewed a slide film

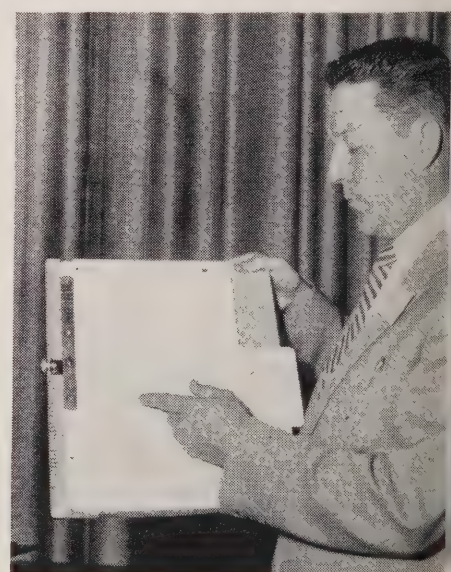
JOHN F. COOK  
Windsor Utilities Commission



NEIL UPSHALL  
Etobicoke Township  
Hydro-Electric Commission



ROBERT GRAY  
Western Region  
Ontario Hydro





indicating the multiplicity of forms used by various municipalities. John Irvine, Etobicoke Township, D. Bruce Michie, Mimico, and Victor Atkins, Toronto Township, members of the records and forms sub-committee, stated it was their intention to try to standardize and simplify such forms in the interests of efficiency.

On A.M.E.U. organization, J. W. Hammond, Hamilton, pointed out that the work of that body had increased, and as a consequence its functional organizational plan had been streamlined to enable it more efficiently to cope with the increasing volume of its responsibilities.

Delegates were brought up to date on details of the new organization indicated by a chart, with Mr. Hammond explaining how liaison arrangements between the various committees not only facilitated the speedy channelling of information to the proper groups, but prevented duplication of work.

Malcolm J. Brian, Chairman of the Windsor U.C., extended a hearty welcome to the delegates. Brief addresses were also made by O.M.E.A. President Gordon H. Fuller, Windsor, and A.M.E.U. President E. A. Washburn, Stratford.

### Review of Expansion

Rounding off a busy and instructive day was an after-dinner address by J. R. Montague, former Director of Engineering, Ontario Hydro.

Mr. Montague, who was introduced by Ontario Hydro's Assistant Comptroller G. A. Honsberger, reviewed "Hydro Expansion." Slides depicting several Hydro generating stations were shown and a verbal description of each was provided.

Discussing the contract made by the Commission in 1907 with the Ontario Power Company for 75,000 kilowatts from the company's pioneer generating station at Niagara Falls, Mr. Montague said many people at that time protested that the province could never use such a large block of power.

"Time" he said, "has shown how wrong was this view, as some direct industrial customers now use more than 75,000 kilowatts each to operate their plants."

In the decade since 1945, Ontario Hydro had spent more than one billion dollars in expanding its facilities, and on the construction side this had resulted in 15 of the 21 new power sources authorized being brought into operation. Hydro's total resources at the end of last year had reached more than 4.5 million kilowatts, representing an increase since 1945 of 134 per cent.

Touching briefly on the recent sod-turning ceremony near Hydro's Des Joachims Generating Station for the Nuclear Power Demonstration plant, Mr. Montague remarked that this was Canada's first step into the realm of nuclear-electric power generation, but that the day when power from stations such as NPD would be economical for base load operations was still far distant. "However" he added, "when that day comes, Hydro may take pride in having participated in a pioneering project that will certainly have played a large part in converting research data and tentative blueprints into an accomplished fact."

In another phase of the conference, a panel composed of Ross R. Logan, Toronto, Chairman, and Robert Jarvie, Windsor; J. S. Coubrough, Hamilton, and R. H. Becker, Kitchener, discussed Work Order Accounting, following presentation of a comprehensive paper on this subject by Mr. Logan. An interesting luncheon address was provided by Austin Grant, who spoke on "Cycles of Man in the Hour-glass."

In addition to augmenting their knowledge of accounting and associated subjects, delegates also visited the new head office of the Windsor Utilities Commission and the J. Clark Keith thermal-electric station.

*by Frank C. Wood.*

LADY delegates (left to right): Mrs. Irene Hudspeth, Mrs. Betty Ireland, Riverside, and Mrs. Raymond Renaud, Jr., Tecumseh, watch as G. H. Francis demonstrates a billing machine.







# BRITAIN'S



**O**NTARIO Hydro and the associated municipal electrical utilities were represented by former Chairman Dr. Richard L. Hearn at a historic ceremony in Great Britain a few weeks ago when Her Majesty, Queen Elizabeth, sent power flowing into the national grid from the United Kingdom's first nuclear-electric generating station.

Shortly after noon on October 17, the Queen moved a small switch and Calder Hall became the world's first full-scale nuclear-electric power plant to come into operation.

One press report of the Royal opening said that a huge dial "over Calder Hall's freshly-painted front door . . . suddenly came to life as its black pointer ticked off the amount of juice pouring into the national grid."

Aptly enough the coal-and-steel town of Workington, nearby, was selected to receive the initial supply of nuclear-generated electricity. Workington's 30,000 citizens bore the full impact of the prewar depression during the 1930's.

With two reactors in full operation, Britain's first nuclear power station will be able to meet the domestic energy needs of a city like Toronto.

Calder Hall will generate 92,000 kilowatts of electricity and will also produce plutonium as a by-product for use in the nuclear

◁ SCENE at Calder Hall as Queen Elizabeth, flanked by Lord Privy Seal R. A. Butler, scientists and representatives of other nations, threw the switch to bring the world's first nuclear-electric station into operation.

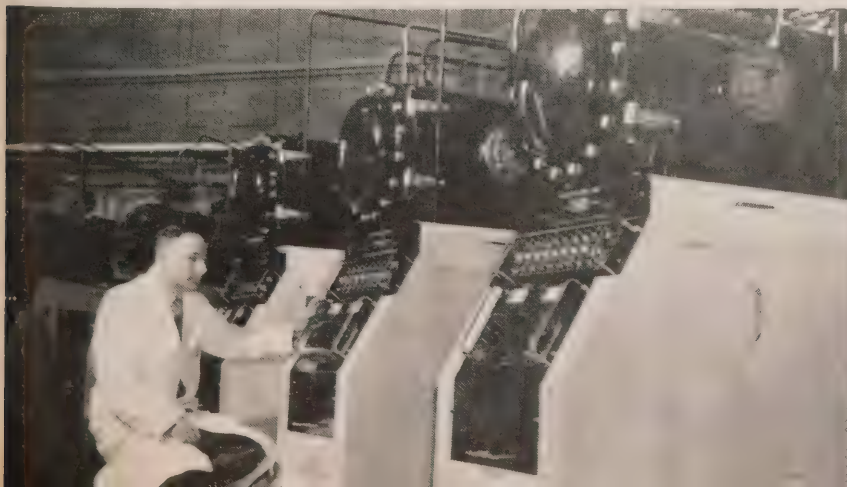


# FIRST

research reactors of that country. The sale of this material, coupled with the high cost of coal in the United Kingdom, will enable Calder Hall to supply power at the same cost as that produced by Britain's conventional coal-burning stations. Three more stations of the Calder Hall type are, at present, under construction, one adjacent to the original plant and two in Dumfriesshire, Scotland.

In August, 1956, important changes were made in this program, full details of which will be made public in November. Broadly, these changes will mean the building of 16 nuclear stations instead of 12, each new station to have perhaps twice the electrical capacity of those first envisaged. The combined output of these 16 stations will probably be between five and six million kilowatts, representing the consumption of almost 18 million tons of coal per year in conventional thermal-electric stations. ■

THIS technician is checking a precipitator unit in the "Sniffer Control Room." To prevent serious contamination of the cooling gas by fission products or escaping uranium, the gas flowing through each of the 1,500 fuel channels is sampled every 30 minutes by this "sniffer" apparatus at Calder Hall.

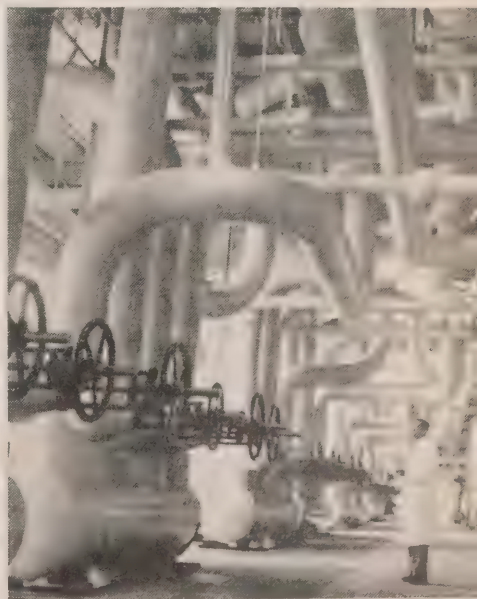


THESE two reactors at the Calder "A" station house the nuclear furnaces in which heat is generated for making steam. At the corners of each of the large buildings stand the four steam-raising heat exchangers.

VIEW of the No. 1 reactor at Calder Hall. The plant will have a capacity of 92,000 kilowatts which will be fed into the national grid. It will also produce plutonium for use in a nearby atomic plant at Windscale.



THIS maze of pipes in the basement of the Calder station's turbine hall includes feed water de-aerators, steam receivers, a de-superheater and the feed cooler for the heat exchangers of the plant's No. 1 reactor.





**THUNDER BAY CONFERENCE**

# Spirit of Confidence

**District 3 O.M.E.A.**

**Delegates greet Hydro**

**Golden Jubilee Year**

**with unbounded**

**optimism**

**I**RON ore developments that beggar description — gold, lithium and copper mines — continuing expansion of an already gigantic pulp and paper industry — new towns and wide highways form the realistic basis for an unrestrained optimism that prevails throughout the northwestern region of Ontario. Speaker after speaker at the District 3, O.M.E.A. Convention held recently in Port Arthur was able to support this spirit of confidence with facts and figures.

The convention also marked the Hydro Golden Jubilee and brought to light a remarkable parallel that has existed during the last half-century between the growth of Hydro facilities in the area and its economic development.

Speaking before the 90 delegates and guests attending the main ban-

quet, former Hydro Chairman Dr. Richard L. Hearn traced the development of northwestern Ontario from "a vast region of uncharted lakes and forests" to "an area dotted with thriving communities, pulp and paper mills, prosperous mining sites and large-scale hydro-electric developments."

Recalling that the Commission had first supplied power purchased on contract from the Kaministiquia Power Company to Port Arthur late in 1910, the speaker compared the lakehead city's load of approximately 2,200 kilowatts in 1911 with the present-day requirements of some 35,400 kw.

## **Industrial Growth**

Industrial growth in both Port Arthur and Fort William had resulted in construction of the Cameron Falls Generating Station, which be-





△  
DELEGATES board the "Coastal Queen" for a trip on Lake Superior during which they inspected the growing port installations of the Lakehead Cities of Fort William and Port Arthur.

gan delivering power to Port Arthur in 1920 and to its sister city in 1926.

Power from the Nipigon River had played an effective role in the development of the grain trade at the lakehead. Expansion of the gold mining and milling operations in the northwestern area were due, almost entirely, "to the availability of power from Cameron Falls and also from Ear Falls in 1929, as well as the Alexander G. S. on the Nipigon River, brought into service in 1930, and the Rat Rapids plant which followed in 1935."

The output of the nine producing gold mines of the northwest for the first seven months of this year was valued at almost \$11 million, Dr. Hearn pointed out, while iron ore, as well as copper and zinc developments in northwestern Ontario, were factors when considering demands for electric power.

Summing up, the speaker reported that the average load of the mining

industry in the Northwestern Division increased by 313 per cent (from 16,100 kw. to 66,500 kw.) between 1945 and 1955.

### Bright Outlook

Turning to the pulp and paper industry, Dr. Hearn termed the outlook "equally bright." Stressing the impact of electricity on this enterprise, the speaker indicated that the average load of the pulp and paper industry in the Northwestern Division increased by 191 per cent (from 48,500 kw. to 141,300 kw.) between 1945 and 1955. Last year the gross value of production from Ontario's pulp and paper mills amounted to \$385 million, or 30 per cent of the total for all of Canada.

Discussing projected expansion in this industry, Dr. Hearn indicated that contemplated extensions at several plants would increase the productive capacity of pulp and paper mills in the region from 663,000 tons of newsprint this year to 985,000 tons by 1960.

This factual address also included references to important hydraulic developments underway in Hydro's Northwestern Division, as well as the recently-concluded agreement between Ontario Hydro and The Manitoba Hydro-Electric Board providing for the interconnection of the Northwestern Division with the electrical facilities of the neighbor province (see *Ontario Hydro News* — October, 1956).

"It is also envisaged that the Northwestern and Northeastern Divisions will be interconnected to form the final link in an integrated system, which includes Ontario, Quebec, New York State, Michigan and now Manitoba."

Turning to the future, Dr. Hearn discussed the question of impending power developments in northwestern Ontario. In this connection, he pointed out that undeveloped hydraulic sites in this section of the province offered a possible total capacity of 223,000 kw. to meet future demands.

### Thermal Plant

Despite this reserve, Hydro was already investigating three possible sites for the location of a proposed thermal-electric plant at the lakehead.

"Such a station, when built, would provide added assurance to the northwestern system and particularly to the lakehead municipalities against possible periods of low water or system interruption."

In view of the dwindling hydraulic resources of the province, it was obvious that the development of increasing quantities of power from thermal-electric plants would be necessary, while only the future could determine the division between conventional thermal and nuclear-electric generation.

Concluding his address, Dr. Hearn provided his audience with the assurance that "Hydro will explore every avenue to maintain generating

(Continued on page 12)



costs at an absolute minimum."

President C. H. Moors opened the well-attended business sessions with this tribute to Ontario Hydro: "Many of us have had an intimate contact with the operation of Hydro for many years now. We have watched it develop steadily and unfalteringly until today it has become possibly the greatest publicly-owned enterprise of its type in the world. So successful has been its growth that its organizational structure and its engineering developments have been studied by many people from many countries."

"Today," he continued, "it is our responsibility to carry on and, if possible, to improve that standard of service which Hydro has built up over the past 50 years." He declared this to be the purpose of the convention.

#### Reviews and Forecasts

"Reviews and Forecasts," an address delivered during the business sessions by D. I. Nattress, Manager, Northwestern Region, further supported the glowing predictions of unprecedented expansion that seemed to dominate the convention. He said the year 1956 would be remem-

bered by the Northwestern Region not only as the Golden Jubilee of Ontario Hydro, but also as the year that the power resources of the region reached the half-million horsepower mark. "From present indications," he said, "it will not take the next 50 years to reach one million horsepower."

By graph and chart, Mr. Nattress traced the development of power resources in the region since purchased power was first supplied to Port Arthur in December, 1910—just three months after the first delivery of power by the Commission in southern Ontario. He pointed out that the growth of Hydro "has paralleled or anticipated the industrial and economic development of the country." In his resume, Mr. Nattress referred to several new industrial customers and their effect on the power load of the Northwestern Region, which, he said, was growing at a long term rate of about 9 per cent per year.

Turning to the future, Mr. Nattress stated that the new, 115,000-volt transmission line from Dryden to Kenora and the connection with the Manitoba system were scheduled

for completion in October of this year. Generating facilities would be generally augmented with the completion of the Whitedog station on the Winnipeg River in 1958, supplying 54,000 kw., and additional units at Cameron Falls, Alexander and Manitou Falls scheduled for completion in the same year. A further 75,000 kw. would be available soon afterwards from the Caribou Falls project, already under construction.

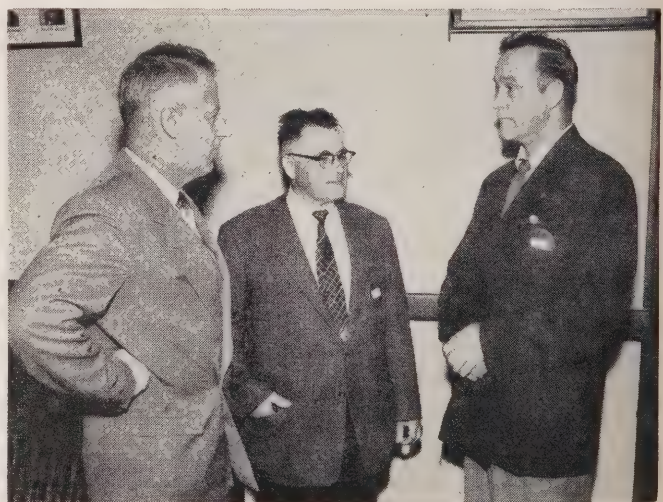
Maynard Falls on the English River, Silver Falls on the Kaministiquia River, and the White, Little Jackfish and Albany Rivers were sources of additional power likely to be tapped in the near future.

On the power load side of the ledger, the speaker was able to pinpoint 11 new or expanding industrial projects, which would require a total of 150,800 kilowatts by 1961. Mr. Nattress stressed that this only took into account definite new load requirements and that unforeseeable developments would very likely add substantially to this total. He said that as a result, thermal-electric generation was very much in the forefront of Hydro planning for this area.

MEMBERS of the new executive (standing left to right): Reeve J. A. Johnston, Atikokan Township; R. B. Chandler, Port Arthur; C. C. Skinner, Schreiber; C. H. Moors, Fort William; Mayor J. L. Skillen, Dryden, and Mayor Helen Hainsworth, Sioux Lookout. Seated is Reeve George A. O'Neill, Nipigon Township, who was elected President this year.



REPRESENTING a new Hydro municipality, Secretary-Treasurer D. R. Burie and Reeve Johnston, Atikokan Township, discuss their new status with Frank Whent, White River delegate (right).





As though determined that none of the delegates should leave the convention with any doubts as to the economic heritage of the district they were visiting, Alexander Phillips, Manager, Northwestern Ontario Development Association, guest speaker at the Friday luncheon, sketched a vivid and revealing picture of regional developments and prospects. He referred to the 212,000 square-mile area, "cradled" in the Precambrian shield, as "the mightiest treasurehouse of minerals to be found anywhere in the world." He stressed the scope of iron ore deposits in the district and intimated that all of this ore was not destined, forever, to be processed beyond its boundaries.

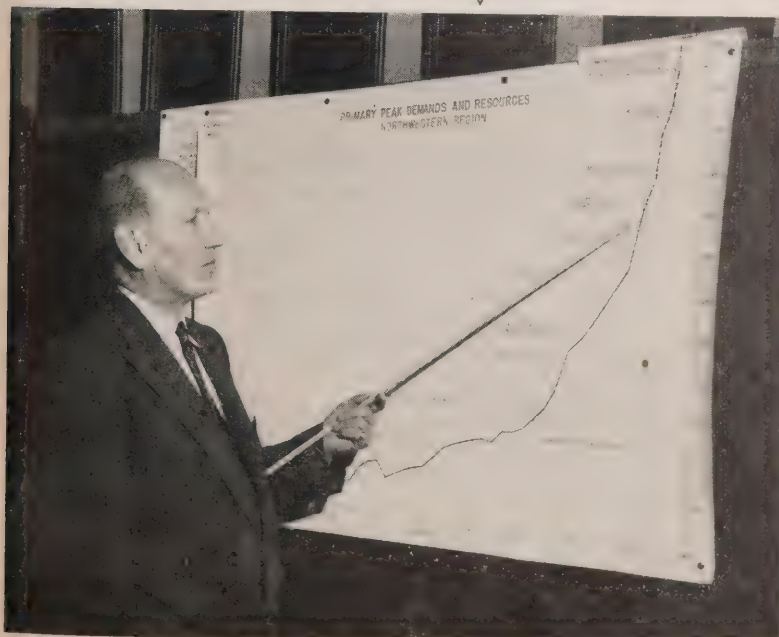
Among his forecasts, Mr. Phillips predicted that the present \$175 million annual production of the pulp and paper industry in northwestern Ontario would be doubled within 10 to 15 years. He paid tribute to the early Hydro pioneers who, he said, "were able to catch the spirit of this region and assure it the power necessary for its development." At an earlier luncheon ses-

*(Continued on page 24)*



△  
FORMER Chairman Dr. Richard L. Hearn, as guest speaker, traced the economic and electrical progress of northwestern Ontario in the past half-century. Retiring District 3 President C. H. Moors, Fort William, and O.M.E.A. President Gordon H. Fuller, Windsor, are on the right.

MANAGER D. I. Nattress, Hydro's Northwestern Region, used this chart to discuss power resources and demands throughout the area.



ALEXANDER Phillips, Manager, Northwestern Ontario Development Association, was another speaker. R. S. Reynolds, Chatham, and George O'Neill, Nipigon, are on the left.



# A New Home

Public inspects Meaford P.U.C. building  
during official opening ceremonies

MEAFORD'S new utility headquarters with its impressive main entrance and large windows presents a pleasing appearance both day and night. The main office is on the right.



MEAFORD Public Utilities Commission, celebrating its 34th birthday this year, marked the occasion recently with ceremonies officially opening its modern, one-storey headquarters building just a few steps off the town's main street.

The new yellow brick structure, which features wide street windows and a handsome glass foyer, replaces the former cramped quarters in the town hall and incorporates well-planned accommodation for maintenance staff, storage and commission vehicles.

E. N. Cooper, Chairman of Meaford P.U.C., welcomed guests at a special dinner on September 25 to mark the official opening of the new building. Commission employees were on hand at the new offices

afternoon and evening to greet visitors.

## Increased Power Load

J. C. Ferguson, Manager, Georgian Bay Region, as guest speaker, predicted an ever-increasing use of power as Meaford continued to grow. Meaford P.U.C. today had a total of 1,421 customers as compared to 650 in 1925, he said. In the same period, the average monthly load had increased from 170 kilowatts to 1,901 kilowatts.

Lt.-Col. A. A. Kennedy, Ontario Hydro Commissioner and President of the Georgian Bay Municipal Electric Association, addressing the dinner guests, complimented the Meaford Commission on its foresight in designing the new building. "It is necessary to plan well for the future if we are to meet the growing

requirements of our customers," he told his listeners. "This beautiful new building is an indication that you in Meaford are doing just that."

Charles Crease, Consumer Service Engineer, Georgian Bay Region, described the building as "an outstanding monument to the hard work and foresight of the staff of Meaford P.U.C." He told dinner guests of the impact the growing appliance load was having on the local commissions.

Quoting from a recent magazine article by Dr. Richard L. Hearn, Mr. Crease said studies recently completed indicate that, within the next 25 years, Ontario Hydro must be prepared to expand its resources to some 23.6 million kilowatts, more than five times the present figure.





MEMBERS of the Meaford Commission (left to right): M. W. Downs, Manager; E. N. Cooper, Chairman; Commissioners Mayor Robert F. Richardson, Frank Harding and William Booker are shown around the conference table in the new board room.

MRS. Eustace Grant (centre) and Mrs. J. H. Parry (right) were among the visitors inspecting the new building under the guidance of Mrs. Florence Ward, billing clerk, during the open house.



Other guests who attended the dinner were Gordon Patterson, Consumer Service Supervisor, Georgian Bay Region; Matthew Dillon, Manager, Thornbury P.U.C.; William Lane, Superintendent, Collingwood P.U.C., and Robert Butter, Manager, Owen Sound P.U.C.

#### Formed in 1922

The opening of the new Meaford building coincides with the Ontario Hydro Golden Jubilee celebrations this year. Formed in 1922, Meaford P.U.C. one year later purchased and rebuilt the power lines owned by the Georgian Bay Milling and Power Company. Subsequently Hydro service was inaugurated in Meaford on January 31, 1924.

The town, situated in the rich fruit-farming district along the

southern shore of Georgian Bay, counts among its industries an internationally-known turbine manufacturing plant; woollen textiles mill; cabinet hardware manufacturing plant; furniture, and hardwood flooring plants and allied wood working trades. Fruit farming, packing and cold storage also are major industries.

The new utility building is designed to serve the utility needs for years to come. Anticipating a continued rapid growth in the power load and a steady rise in the number of industrial and domestic customers, the Meaford Commission has provided office, storage and work space in the building to accommodate the additional staff needed as the utility expands.

The building is 58 feet wide and

100 feet long. A handsome board room, panelled in natural wood, and a large outer office are placed strategically at the front. A walk-in vault, parking garage, spacious storage room and basement are additional features.

Chairman of Meaford P.U.C. is E. N. Cooper, who has been a member of the commission for 23 years, 17 of them as chairman. Vice-Chairman is William Booker, a senior resident of the town, in his 17th year as a commission member. Mayor Robert F. Richardson, Frank Harding and Clifford Richardson complete the commission, with M. W. Downs as Manager.

Members of the commission feel confident that the new building will provide even better service to Meaford. — by Gary Smith.

By Harry M. Blake

**"do-it-yourself"**

# Power Plant



ABRAHAM Gingerich, a retired farmer living near Baden, Ont., could, conceivably, be considered the "father" of the present-day "do-it-yourself" trend.

The story goes back to 1912. Rural electrical services had not yet been brought to the district and it looked as if it would be some time before they would be available. Gingerich had seen Kitchener (then Berlin), Waterloo, Preston, Galt and other urban municipalities "lighted up" by Ontario Hydro and the people there enjoying the benefits of Niagara power. He grew impatient and one day he took the train to Guelph where he purchased a 10-kilowatt generating set for \$185. It proved rather expensive to operate and its use was restricted to his workshop. However, he stuck with it until the construction of the Commission's first Niagara development was well under way and crews were working at the building of the powerhouse at Queenston. Then he paid several visits to Niagara to get, as he says, a basic idea of how hydro-electric plants were built. He told

Sir Adam Beck, who was born at Baden, that he was going to build a power plant of his own, and Hydro's first Chairman, while interested, suggested that he abandon the idea because he would soon be getting plenty of power from the Commission. Gingerich, however, had been nursing the scheme for a long time and he was not disposed to give it up.

## Alsatian Grandfather

"My grandfather came out from Alsace in 1823," he reminded the first Chairman of Ontario Hydro. "Like your own ancestors he was a good man to settle in a new country because he knew how to build houses, barns and waggons and was skillful in the use of tools. And now, Sir Adam," he added, with a waggish sprightliness, "I'm going to tell you something that perhaps you've never heard before. My grandfather was a coach builder for the great Napoleon. He built the only vehicles that stood up during the invasion of Russia in 1812."

"But he didn't build a power plant," objected Sir Adam, when

he had recovered from his surprise.

"No, but I have inherited his skills, and I'm going to turn them to new account. You'll see."

## 17-Foot Head

Quite a large pond, fed by creeks, had been impounded on the Gingerich farm. Its outlet into a drainage ditch took the form of a miniature, gradually-descending waterfall. After checking on the work he had seen going on at Niagara, Gingerich decided upon a simpler construction plan. With some embanking, concreting and excavation, it would be possible to obtain a head of about 17 feet. The pond, itself, would be the forebay and a two-inch pipe could be used for a penstock. The powerhouse would fit like a box between the sides of the ditch and he would employ massive concrete slabs in the construction of the walls and "headworks." All he would then have to do would be to build a suitable waterwheel and connect it with the generator he already had on hand.

## Home-Made Waterwheel

All the ingenuity Abraham had





▽ THIS undershot waterwheel in the Gingerich powerhouse was connected with the miniature generating apparatus by a driving wheel and belt.

ABRAHAM Gingerich, retired Baden district farmer, points to the remains of his novel little generating station, which operated on a 17-foot head.



inherited from his coach-building grandfather was exercised in the fabrication of the waterwheel. It was an undershot type—Gingerich himself describes it as a “pitch-back”—and was built much to the shape of a huge cartwheel. The wide rim, set at a correct angle to receive the full impact of water from the penstock, was built of small wooden sections, with a marginal overlap like shingles fitted into a frame supported by spokes radiating from the axle hubs. The waterwheel was connected with the generator by a driving wheel and belt.

The Gingerich “home - made” power plant appears to have operated well enough for the purposes its designer built it, but it was not as economical or reliable as Hydro-generated power, and after it had been used for about six years, it was given up in favor of Commission services.

After the dismantling of the plant, uncontrolled natural forces did their work, resulting in the present ruins.



# NEW NAME



A GALT Commissioner since 1923, Harvey Hawke (right), was presented with an illuminated address by President T. J. Moffat in recognition of his numerous contributions to the O.M.E.A.

## District 6 becomes Grand Valley Municipal Electric Association with a fully paid-up membership

IN THE ideal setting of the Grand River Golf and Country Club, at Waterloo, the Grand Valley Municipal Electric Association had its annual convention. Everyone present for the enjoyable occasion recognized District No. 6, O.M.E.A. under its new name, and there was general agreement that the name was appropriate and welcome, in line with the suggestion that the various district associations identify themselves closely with the areas they serve.

It was a proud moment, too, for President T. J. (Tom) Moffat, when he was able to announce that the association had a completely paid-up membership for the first time in its history, Grand Valley M.E.A. being regarded as the first district group to achieve this distinction.

Addressing the 150 or more delegates at the convention luncheon, O.M.E.A. President Gordon H. Fuller said that an additional reason for celebrating Thanksgiving in October was the fact that Hydro first came to Berlin (now Kitchener)

on October 11, 1910. Mr. Fuller congratulated Waterloo upon its achievements in the past century, stressing the municipality's contribution to Ontario's publicly-owned Hydro systems. He recalled the efforts of E. W. B. Snider, D. B. Detweiler and Adam Beck (all of whom came from Waterloo County in the formation of Ontario Hydro, which had now reached out to a new source of power, by co-operating in the construction of Canada's first nuclear-electric generating station.

"With many of you," said Mr. Fuller, "I was present near the Village of St. Jacobs on May 14 this year when the light on a hill near the village was dedicated in memory of your esteemed compatriot, E. W. B. Snider. It was a long-deferred, but long-deserved recognition of the man who was chairman of the first meetings in the interest of public ownership of Hydro some 54 years ago. Most appropriate, indeed, is the symbol of eternal light atop the 20-foot monument; it reminds us of one of the

men who carried the torch that kindled the flame of public ownership."

Declaring that the citizens of this province were the beneficiaries of Mr. Snider's vision and courage, Mr. Fuller urged delegates to safeguard and make wise use of their inheritance.

"Collectively, the elected municipal representatives across this province are largely the executors of this legacy. It would seem to me that you in this district have a special responsibility."

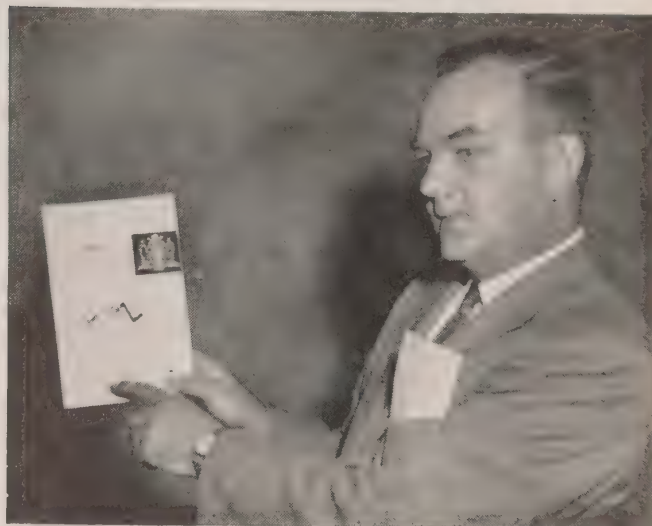
Greetings to the convention were extended on behalf of the Mayor of Waterloo by Alderman Peter Stewart. Howard Schiefele, Chairman, Waterloo Public Utilities Commission, acted as master of ceremonies, and thanked the luncheon speakers. He also paid tribute to Eby Rush, former Waterloo P.U.C. Superintendent, saying that Mr. Rush had been associated with utility work before Hydro came into being and that



INTERMISSION found three Drayton delegates (left to right): Frank Brandon, A. E. Andrews, H. G. Smith, discussing utility problems with Stuart G. McEwen, Palmerston.



ROY Beith, Manager and Secretary-Treasurer, Electrical Employers' Association, Toronto, scores a point with the aid of this illustrated graph during his address to delegates on electrical safety.



"he and D. B. Detweiler ate out of the same lunch-box."

### Presentation

A pleasant highlight of the luncheon was the presentation to R. B. (Bob) Hanna, Secretary-Treasurer of the association, of a suitably-engraved briefcase for the use of persons serving in this capacity. The presentation was made by John McMichael, Chairman, Listowel P.U.C.

President Moffat, in summing up the year's activities, said that District 6 was selected as the first to sponsor visits of local commissioners to Ontario Hydro's Head Office and buildings at Toronto, and the results had been gratifying.

In response to a query from C. K. Merner, New Hamburg, relative to the new name of the district association, President Moffat said the matter had been discussed thoroughly at all levels, and, as a large portion of the district lay within or adjacent to the Grand River Valley, it was felt that the name was both logical

and ideal. He said that Lt.-Col. A. A. Kennedy, Ontario Hydro Commissioner and Past President of the O.M.E.A., had suggested that the various districts should identify themselves with the areas they served, and, therefore, the District No. 6 group was proposing to call itself the Grand Valley Municipal Electric Association. The delegates endorsed the idea heartily.

### Panel Discussion

A panel discussion on fire insurance, led by W. Ross Strike, Hydro's First Vice-Chairman, enlivened the session. On the panel were: Mayor J. E. Huckins, Goderich; Dr. H. A. Mutton, Mitchell; O. J. Little, Preston, and H. O. Hawke, Galt. Three types of insurance were discussed—fire, liability and automobile.

The panel discussion "sparked" a resolution on fire insurance that asked the parent O.M.E.A. to urge upon Ontario Hydro the advisability of investigating a fire and truck group insurance program for municipal utilities. The resolution,

which will be forwarded by the district to the O.M.E.A. for action, further asked that "after ascertaining the savings resulting from such a policy, the Commission arrange group fire and vehicle coverage on behalf of the municipalities." It was pointed out that the Canadian National Railways and other large public corporations carried their own fire insurance coverage, and that it was "considered advantageous some 20 years ago for municipalities purchasing power from The Hydro-Electric Power Commission of Ontario to take group coverage for public liability and property damage." The resolution stated that this latter move had resulted in the saving of "several million dollars for the Hydro consumers of Ontario, at the same time offering maximum coverage to all municipal Hydro systems."

H. G. Slean, in the unavoidable absence of Harry Foy, presented a paper on adequate wiring on be-

*(Continued on page 20)*





MORE than 40 ladies, including (left to right): Mrs. Gordon H. Fuller, Windsor; Mrs. T. J. Moffat, Listowel; Mrs. Howard Scheifele, Waterloo, and Mrs. C. K. Merner, New Hamburg, attended this year's convention.



MEMBERS of the Grand Valley M.E.A. 1956-57 executive (first row, left to right): D. F. Kissner, Kitchener; George Glover, St. Marys, President; H. E. Dickinson, St. Marys; J. F. Edwards, Palmerston; O. J. Little, Preston; (second row, left to right): H. O. Hawke, Galt; A. R. Moore, Stratford; R. G. Charlton, Hespeler; H. Scheifele, Waterloo, T. J. Moffat, Listowel.

half of the Electric Service League of Ontario, calling for greater efforts in promoting better wiring in homes and other buildings. Harry Hyde, Assistant Chief Engineer, Toronto Hydro, repeated his interesting and enlightening talk on load growth that has highlighted several previous conventions. Ontario Hydro's Rate Study Engineer, A. W. Murdock, speaking on "Rate Structures" stressed the advantages of the four-block domestic rate structure, and predicted that eventually all municipalities would change to this method of billing for domestic customers. Bert Merson, Chairman of Toronto Hydro, gave a report on the Municipal Hydro-Electric Pension and Insurance Plan, and urged all municipalities to participate in this plan. Roy Beith, of the Electrical Employers' Association, spoke on electrical safety.

George Glover, St. Marys, succeeded Mr. Moffat as President, the latter being elected Second Vice-President. The following officers were also elected for the coming term: 1st Vice-President, Howard Scheifele, Waterloo; Secretary-Treasurer, H. E. Dickinson, St. Marys; Directors: Mayor J. E.

Huckins, Goderich; A. R. Moore, Stratford; O. J. Little, Preston; Dr. H. A. Mutton, Mitchell; J. Fred Edwards, M.P.P., Palmerston; A. J. Girdwood, Quelfh; R. G. Charlton, Hespeler, and D. F. Kissner, Kitchener.

Members of the Waterloo Public Utilities Commission were hosts at the banquet following the business session. Spareribs and pigs' tails, district specialties, featured the menu for this complimentary dinner.

### Ontario Hydro Greetings

Lt.-Col. Kennedy, Ontario Hydro Commissioner, as President of the Georgian Bay District, extended greetings, while Hon. W. K. Warrender, former Vice-Chairman and W. Ross Strike, now First Vice-Chairman, were also heard in brief messages.

E. A. Washburn, President of the A. M. E. U., brought greetings from that body, and stated that President Tom Moffat had been instrumental in having the A.M.E.U. set up a "utility group." Under this plan, management representatives of several municipalities had visited other utilities to compare methods of operation and thereby increase efficiency in the respective municipal-

ities. This plan, for which the O.M.E.A. bore the expenses, had proved beneficial, Mr. Washburn stated, in commending Mr. Moffat for advancing the idea. Mr. Washburn also praised the co-operation received from Ontario Hydro, which had staff members on practically all the A.M.E.U. committees and sub-committees.

There was loud applause for Harvey Hawke when he was the recipient of a double honor. A member of Galt Commission since 1923, and "still going strong," Mr. Hawke was presented with an illuminated address by President Moffat on behalf of the district association, in recognition of his many services, and marking his appointment as an Honorary Vice-President of the Grand Valley Municipal Electric Association. Then Mr. Hawke was presented with a leather travelling bag in honor of his 75th birthday. The President also presented the retiring Secretary-Treasurer, R. B. Hanna, with a memento of his valuable work on behalf of the district organization.

On the invitation of Mayor D. R. Stevens, the 1957 convention will be held at St. Marys, home town of President-elect George Glover.

—by Horace Brown.



## ALONG HYDRO LINES



### Surplus St. Lawrence Land to be Defined

Certain sections of land purchased by the Commission in undertaking the St. Lawrence Power Project and found surplus to the requirements of the development are to be zoned for industrial use. Making this announcement at Cornwall recently, while addressing members of the Toronto Board of Trade, Ontario's Minister of Planning and Development, Hon. William F. Nickle, said such a plan is of importance both in regard to providing employment and helping with taxation in localities where industries establish.

The Minister said the question of defining surplus land areas is under urgent study by the Ontario Government and Ontario Hydro.

### Plan Service For Thorne

Thorne, just south of Temiskaming on Highway 63, and other residents in the vicinity, are scheduled to receive power from Ontario Hydro shortly by means of a new line now being strung. Thorne is presently served with power by a nearby paper company.

### Seaforth P.U.C. Plans Shop and Garage Building

Seaforth Public Utilities Commission is to undertake a construction program to provide shop accommodation and a garage.

Plans calls for a concrete block building, with 1,500 feet of floor space, located at the rear of the town hall. Forming part of a composite plan, it is designed to provide necessary accommodation for both utility and municipal facilities.

Construction work will be supervised by the municipal Property Committee, with P.U.C. Chairman Frank Kling acting as co-ordinator.

### P.U.C. Executive Takes New Post

After 23 years' service with the City of Port Arthur, Irving L. Oberg, Secretary-Treasurer of Port Arthur P.U.C., has resigned to become business manager of Port Arthur Clinic. Mr. Oberg, who started his civic career with the city treasurer's department, served overseas from 1943-1944. Following a year's convalescence from a war wound, he resumed his duties with the treasury office at Port Arthur in 1946, resigning to accept the secretary-treasurer's position with the utility.

## METERMEN VISIT PROJECT

GATHERING at Cornwall, Ont. recently for their annual fall meeting, members of the Eastern Ontario Metermen's Association were guests of Ontario Hydro during a tour of the St. Lawrence Power Project area. Here, Chief Guide Glen Hughes points to the heavy house-moving equipment used in community rehabilitation associated with the project. Looking on (left to right) are: Ormond Griesse, Renfrew; Henry Delorme, Cornwall; Clarence Labell, Smiths Falls; Paul Giguere, Cornwall; J. H. Page, Renfrew; John Lyons, Almonte, and Merle Barker, Gatineau Power Company.



## JAMES S. DUNCAN

*(Continued from page 1)*

Commonwealth Air Training Plan shortly after the beginning of the Second World War. He was also named Chairman, Combined Agricultural and Food Committee at Washington, D.C., in 1941 and 1942. Interested in the improvement of trade relations between Canada and the United Kingdom, Mr. Duncan guided the formation of the Dollar-Sterling Trade Board in 1949. He became Chairman of this group, which comprises prominent British and Canadian representatives. Recognition of his achievements on behalf of the Allies during World War Two brought several honors to Mr. Duncan, who was made a Companion of the Most Distinguished Order of St. Michael and St. George (C.M.G.) by the late King George VI. In addition, he received the Legion of Honor from the Republic of France and the Cross of Liberation from Norway. He also holds an honorary air commodore's rank in the R.C.A.F.

Founder and Chairman of the Australian - Canadian Association, the new Hydro Chairman is also active in several civic and national organizations, being a Governor of the University of Toronto, and Chairman of the Board, St. Andrew's College, Aurora. He is an active supporter and Vice-Chairman of the Royal Conservatory of Music of Toronto and other cultural organizations.

Of particular interest is the fact that he served as Chairman of the recent National Engineering Manpower Conference in September this year, and was designated as the Canadian Businessman of the Year by the National Sales Executive Organization at Chicago in June, 1956. Widely-travelled, Mr. Duncan is also noted as a public speaker and linguist.

### Hon. Ray Connell

Ontario Hydro's Second Vice-Chairman, Mr. Connell, was born in 1916 in West Flamboro Town-

ship. Educated at Bowman Public School and Dundas High School, he has engaged in farming while taking an active role in civic affairs. He was honored with election as Warden of Wentworth County in 1950 while Reeve of West Flamboro Township. First elected to the Ontario Legislature in 1951 to represent the Wentworth riding, he was re-elected in 1955. Interested in fraternal and service organizations, Mr. Connell is a member of the Masonic Lodge and of Dundas Lions Club.

### David P. Cliff

Particularly noted for his active participation in the affairs of the Ontario Municipal Electric Association, David P. Cliff, new Hydro Commissioner, is a member of a pioneer Dundas family. Identified with the affairs of his community for several years, Mr. Cliff was elected to Dundas Town Council in 1937, and in 1945 was mayor of that municipality. He also served as Warden of Wentworth County in 1943.

Since 1945 he has devoted considerable attention to the operations of Dundas P.U.C. He has served as a Commissioner continuously since 1945, and, on several occasions, has been chairman of the Dundas Commission. Prominent in the affairs of District 5 O.M.E.A., he was elected to the presidency of the parent organization in 1950, a position he occupied with signal success for two consecutive terms. He was appointed as a member of the Ontario Hydro - Electric Advisory Council in 1951, and in 1952 he assumed the position of O.M.E.A. Secretary-Treasurer.

Active on the executive of the Wentworth Children's Aid Society, he has also been Chairman of the Wentworth Assessment Court; a member of the Dundas Rotary Club and Board of Trade; Chairman, Finance Committee, Dundas Recreation Commission; a Past President of the Dundas Historical Society and Chairman of the Dundas Arena Commission. ■

## New Transformer Station To Serve Aylmer District

Ontario Hydro is to construct a new transformer station on a 9-acre site on Highway 73 immediately north of Aylmer. Designed to provide improved service to Aylmer, Aylmer R.O.A., Springfield and district customers, the new station will replace St. Thomas T.S. as a source of power supply, to meet increasing load growth in the Aylmer area. A new service centre for Aylmer Area will be constructed on the same site. This will provide a stores warehouse and garage facilities for the area.

## Bolton Hydro Secretary Passes

Ervan Roy Wilkinson, Secretary of the Bolton Hydro-Electric Commission since 1941, passed away recently in the Peel Memorial Hospital Brampton, in his 63rd year. He is survived by his wife, the former Lenna Beamish, of Bolton.

A native of Brampton, Mr. Wilkinson attended normal school, and was a teacher for several years. Interested in mechanics, he gave up teaching, and 36 years ago moved to Bolton where he was employed as a motor mechanic. He later operated a store in Bolton. Ill-health forced his retirement in 1954.

One of Bolton's most public-spirited citizens, the deceased served as director, manager and secretary-treasurer of the Bolton Rink Co. Ltd., and took a keen interest in hockey, lacrosse and baseball teams, being a member of the Bolton Lacrosse team, which won the Peel County Championship in 1922. He was also a curler, a lawn bowler and a hunter, being active in the Peel Game and Fish Protective Association since its inception. Always interested in education, he was Bolton's representative on the Brampton District High School Board.

As Secretary of the Bolton Hydro-Electric Commission, he served during a period of rapid growth.



## AWARD CONTRACT FOR "NPD" BUILDING

A CONTRACT for construction of a building to house Canada's first electric power reactor has been awarded to The Foundation Company of Ontario Limited. Name of the successful tenderers was announced jointly on October 23 by Canadian General Electric Company, Ontario Hydro and Atomic Energy of Canada Limited.

Total amount of the contract for station building work is slightly in excess of \$1,000,000. Work consists of site development, establishment of a construction camp, excavation, and carrying out the concrete and superstructure construction.

The Nuclear Power Demonstration station building will be located on the Ottawa River a few miles downstream from Ontario Hydro's Des Joachims Generating Station. The building will be 200 feet by 200 feet in size, with a steel frame and asbestos siding. The structure will be 40 feet above ground at its highest point and will have concrete works extending 60 feet below ground level.

Site development work will be carried on during the winter months with construction work to begin in the spring of next year. The building is scheduled for completion in the fall of 1957. Nuclear Power Demonstration (NPD), with a capacity of 20,000 kilowatts, is scheduled to come into operation in 1959.

NPD is a joint undertaking of three organizations. Atomic Energy of Canada Limited is supplying basic research and nuclear engineering knowledge; Ontario Hydro is providing the site, is responsible for the engineering of the conventional features of the plant and will operate the station on completion, while Canadian General Electric is responsible for the engineering design and development of the reactor and acts as prime contractor for the whole project. ■

## ATIKOKAN PURCHASES HYDRO SYSTEM

ATIKOKAN Township, an important mining community in northwestern Ontario, marked the beginning of a new chapter in its civic development with the recent purchase from Ontario Hydro of the electrical facilities serving the municipality.

At a special meeting on September 18, the Township of Atikokan signed an agreement with the Commission for power supply and an agreement of purchase covering the necessary distribution facilities.

Climaxing the meeting with Ontario Hydro representatives from the Northwestern Region, Port Arthur, Reeve J. A. Johnston presented a cheque for \$364,306 to Manager D. I. Nattress.

Although Ontario Hydro will operate the new system for the municipality until the necessary operating staff has been appointed, the Atikokan Council has appointed a Hydro Committee consisting of: Reeve Johnston and Councillors Robert W. Clark and S. G. Hancock to administer the local system.

In the accompanying photography Reeve Johnston, left, presents the cheque to Mr. Nattress. In the lower photograph, the special meeting



### Honor Retiring Utility Treasurer

Tribute in the form of a testimonial dinner was recently paid to W. J. Ranson, retiring after 40 years' service as Treasurer of the Prescott Public Utilities Commis-

sion. Mr. Ranson was presented by his colleagues with an easy chair and Mrs. Ranson with a bouquet of roses. A valedictory address was delivered by Miss Helen Appleton, who after 34 years of associated service in a clerical capacity, now succeeds Mr. Ranson.

## Provide Nuclear Grant To Hamilton College

ONTARIO Hydro recently announced its decision to provide financial assistance to Hamilton College (McMaster University) for work associated with nuclear reactor installation, operation and studies. In view of the fact that the college already has available a specialized staff and a valuable reservoir of scientific knowledge relating to nuclear energy, the Commission has approved a capital grant of \$200,000 to assist in the nuclear energy program of the college. The development of the nuclear reactor is part of an overall expansion program being carried out by McMaster University under the able leadership of Dr. H. G. Thode, a pre-eminent figure in the Canadian nuclear field.

The announcement represents a further advance by Ontario Hydro in nuclear-electric activities. It was emphasized by the Commission that the information made available from the work being undertaken at Hamilton College will be very valuable as Hydro takes further steps to meet rapidly increasing power demands. At the same time, the nuclear activities at the college

will be very helpful to Hydro in training personnel specializing in the development of power from nuclear energy.

The recent sod-turning for Canada's nuclear power demonstration plant (NPD) on the Ottawa River near Des Joachims Generating Station marked a significant advance by the Commission in the nuclear field. From the knowledge and experience being gained both at NPD and Hamilton College, the Commission will have available valuable engineering, scientific and technical data in the nuclear power field.

Under the terms approved, Ontario Hydro will provide a grant of \$100,000 during 1956 and a further \$100,000 in 1957. In addition, a sum of \$5,000 per annum, for a period of 10 years, will be provided by the Commission to assist in the operating costs associated with the reactor. As further evidence of its interest in the advanced work at Hamilton College, Hydro will appoint a competent engineer, who will be associated with the college in nuclear reactor studies. ■

### SPIRIT OF CONFIDENCE

*(Continued from page 13)*

sion, J. P. Bertrand, local historian, provided some excellent background material, tracing the history of the lakehead from the days of its first prominence as a fur trading centre.

A thought-provoking paper "Natural Gas Comes to Your Town" was presented at the business session by J. E. Teckoe, General Manager, Windsor Utilities Commission. He discussed some of the aspects of operating a publicly-owned electrical utility in competition with a privately-operated gas company. He

felt that strong competition was a healthy condition of business as it tended to promote top efficiency. He was confident that, given a free choice, "the people will utilize electric power for all the tasks it does best." Concerned with the same problem, Harry Foy, Manager, Electric Service League of Ontario, described the strong and effective promotional methods being employed by the natural gas companies. He outlined a special service being undertaken by the London P.U.C. to better their competitive position through an adequate wiring committee. In conclusion he said: "I

feel that such a service as this, operated by the local utility, coupled with the excellent suggestions put forth by Mr. Teckoe, will provide an effective answer to the problem, which utilities will face following the arrival of natural gas in each municipality."

### Insurance Discussion

Adequate insurance coverage of municipal utility properties was among the subjects selected for discussion throughout the O.M.E.A. districts this year. At the District 3 convention a panel under the chairmanship of W. Ross Strike, First Vice-Chairman, Ontario Hydro, examined the question of insurance protection under the headings, fire, public liability and vehicle coverage. Other members of the panel were: Mayor Helen Hainsworth, Sioux Lookout; Reeve George O'Neill, Nipigon; R. B. Chandler, Port Arthur, and Gordon Carson, Fort William.

Gordon Fuller, President, O.M.E.A.; E. A. Washburn, President, A.M.E.U., and Roy Beith, Manager, Electrical Employees Association, also addressed the meeting.

The election of officers concluded the business sessions. Reeve George O'Neill, Nipigon, was elected President succeeding C. H. Moors, Fort William. Also named to the executive for 1956-57 were: C. C. Skinner, Schreiber, 1st Vice-President; Mayor J. L. Skillen, Dryden, 2nd Vice-President. Elected directors were: Mayor Helen Hainsworth, Sioux Lookout; Reeve J. A. Johnston, Atikokan Township, and Ralph Chandler, Port Arthur.

Fort Francis was selected as the site of the 1957 convention.

A hearty vote of thanks was extended to A. W. H. Taber, and Thomas Leeney, Fort William, who worked out the many details of the convention program, which concluded with a boat tour of the lakehead ports as guests of the Northern Engineering and Supply Company.

—By Don Wright.



# This and That

## Board of Trade Bouquet

It's always gratifying to receive a bouquet - either floral or verbal. Hydro has been the recipient of several recently, including one from the Toronto Board of Trade. During a tour of eastern Ontario, members of the Toronto group were guests of the Commission on a tour of the St. Lawrence Power Project.

In a resolution forwarded to the Commission, the Board conveyed appreciation "in particularly warm terms to the Officers and staffs of The Hydro-Electric Power Commission of Ontario, Atomic Energy of Canada Limited and the St. Lawrence Seaway Authority; to the Officers and other ranks at Petawawa Military Camp, and to the Mayor and Corporation of the City of Cornwall, all of whom devoted their time and energies so generously and willingly to the carrying out of our project and were unfailing in their courtesy and attention."

## Perpetuating a Memory

Another letter of thanks has come from Mrs. D. B. Detweiler, Kitchener. Addressed to former Chairman, Dr. Richard L. Hearn, the letter read:

"I feel that I should express the appreciation of the family and myself for the portrayal at the Kitchener Jubilee ceremony of my husband's part in the Hydro story, and of the article on his work in the June issue of the *Hydro News*. For a long time we considered that the picture of Mr. Detweiler's work was being clouded and distorted and might eventually be lost. The article is the most complete that we have seen and presents the story basically as we have known it. It is also a great satisfaction that Hydro is making possible the completion of the scheme on which Mr. Detweiler spent most of his efforts in the later years of his life - the Deep Waterways System. Most of his dreams have taken concrete form and we thank you for this printed record, which will serve to perpetuate his memory."

## From Scylla to Charybdis

Immortalized by Homer in his *Odyssey* of Ulysses, the Straits of Messina have come into prominence in

recent months as the site of the longest, clear span of electric transmission line in the world. Separating Italy and Sicily, the straits were portrayed by Homer as "death" to sailors because of the presence of two monsters, Scylla and Charybdis - actually a rock and a whirlpool flanking the channel. Still a difficult stretch of water, the straits have been bridged by 11,950 feet of steel-reinforced aluminum conductor. Weighing 2.3 lbs. a foot, the heavy cable is designed for 220 kv. transmission.

## More Susceptible

Speaking on electrical safety at Ottawa, V. A. Beamish, Peterborough, is reported to have told his audience that women are 66 per cent more susceptible to electric shock than men. Individual resistance actually determines the outcome of shock. Thus a radio falling into a bathtub might kill one person while a high-current, low-voltage source, such as a car battery, might not have fatal effects on another individual with higher resistance.

## Canny Canine

James Turnbull, Business Manager, Peterborough Utilities Commission, is a former newspaperman, who thought he had heard all the variations of the old story about "man bites dog." But when a lady customer of the utility advised him that she didn't have her Hydro bill as the family dog had eaten it, he felt he had reached a new "high" in tall tales. The fact that the Peterborough customer was quite willing to pay the bill helped to restore his faith in her veracity.

## Evidence

Also out of the routine was the case of a St. Marys motorist who moved a Hydro pole four feet off its base in a car collision and left the scene without reporting to police. When the long arm of the law arrived to investigate they found five of the six license numbers clearly imprinted on the base of the pole. Police checked the possible number combinations and their investigations led them to a local resident, whose car bore evidence of damage, including a license plate bent into a semi-circle.



## MEMORABLE MILESTONES



**B**ACK in 1917 when the Toronto Hydro-Electric System established a display room (left photograph) in one section of a new substation at the corner of Carlaw Avenue and Gerrard Street, stoves were the principal items of domestic electrical equipment available for sale.

The accompanying view of the display room in the Toronto System's Head Office (now located at 14 Carlton St.) presents a striking contrast with its counterpart of almost four decades ago. Saluting Hydro's Golden Jubilee, the handsomely-appointed room, with its displays of streamlined appliances for the modern home, graphically explains the increased electrical requirements of the average domestic customer.





ONTARIO HYDRO

# NEWS

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# Season's Greetings



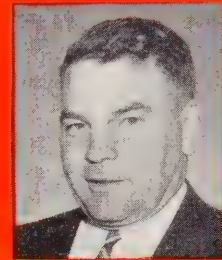
*W. Ross Brown*

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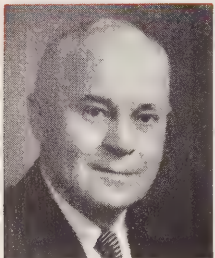
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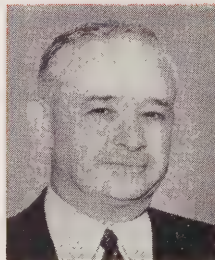
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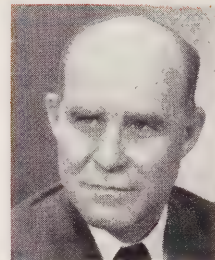
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COMMISSIONER



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GENERAL MANAGER

**W**E approach the Christmas season and the dawning of a new year with renewed confidence in our ability to face the challenges that lie ahead.

**T**HE past 12 months have been historic in many ways. The observance of Hydro's Golden Jubilee has provided us with a valuable opportunity to review the achievements of the first 50 years of service to Ontario, and has awakened a consciousness of the rich legacy bequeathed to us by those whose courage and tenacity were responsible for the formation of the Commission in 1906. We have been reminded, too, of the resourcefulness, ingenuity and unquenchable determination of the small band of engineers, technicians and administrators, who laid the firm foundations for the publicly-owned electrical system that serves the province today.

**I**T has been a year of notable progress — one, we feel certain, that will rank among the foremost years in our history. By our participation in Canada's program for the development of power from nuclear sources, we are confident that we have taken a decisive step that will have a dynamic effect upon the economy and well-being of Ontario and the entire nation in the next half-century.

**I**N looking forward to another five decades of fruitful and rewarding service to the province, we pause to remember the rich significance of this season and to send to all members of the farflung Hydro family our warmest appreciation and our sincere greetings for a **VERY MERRY CHRISTMAS** and a **HAPPY NEW YEAR**.



DECEMBER, 1956

VOLUME 43, NUMBER 12

## THE GIFT OF EDUCATION

AT THIS season of the year, when many Canadians are thinking of gifts, it seems appropriate to consider the countless benefits conferred by the gift of education

The November issue of the brochure, *Industry*, published by the Canadian Manufacturers' Association Inc., directs attention to this subject by declaring that "a nation is only as rich (fundamentally) as the combined knowledge and industry of its people." The publication reports an alarming trend in Canada with the statement that no fewer than one in every three high school students leaves school sometime before graduation, while, of those who do graduate, at least one in every three students feels unable to attend university for financial or other reasons.

This assertion naturally focuses attention on the well-established custom of numerous public-spirited individuals, together with many forward-looking organizations, who are actively promoting and encouraging an interest in higher education among young Canadians by their support of scholarships, awards, bursaries and student-aid loan funds at various universities and other schools across the nation.

It is a source of considerable gratification to report in this issue (see page 8) that Ontario Hydro this year awarded scholarships to 11 students at three Ontario universities and three other educational institutions. In simple terms, these scholarships are awarded for the purpose of encouraging and assisting promising students in the engineering and technical fields, and serve as a tribute to the achievements of graduates in these professions.

Ontario Hydro is particularly proud to be associated in the vital task of stimulating enrolment in professional engineering and technical training courses. There seems to be some grounds for optimism that such financial assistance is having a desirable effect.

The November 10 issue of *The Financial Post* contains a report of a survey by the Engineering Institute of Canada, indicating that registrations in engineering courses at Canadian universities show an increase of 12.2 per cent for the 1956-57 period. The survey revealed that the number of undergraduates in these courses total 12,723 this year, some 1,382 higher than last year's registration of 11,341.

While the E.I.C. survey indicates an upward trend in university registration, it also serves to emphasize the urgency of the present educational crisis. This was stressed at the recent National Conference on Engineering, Scientific and Technical Manpower where it was made quite obvious that each segment of society must play its part with vision, foresight and determination in a concerted effort to overcome the situation.

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# ONTARIO HYDRO

# News

PUBLISHED BY THE HYDRO-ELECTRIC  
POWER COMMISSION OF ONTARIO  
620 UNIVERSITY AVENUE, TORONTO



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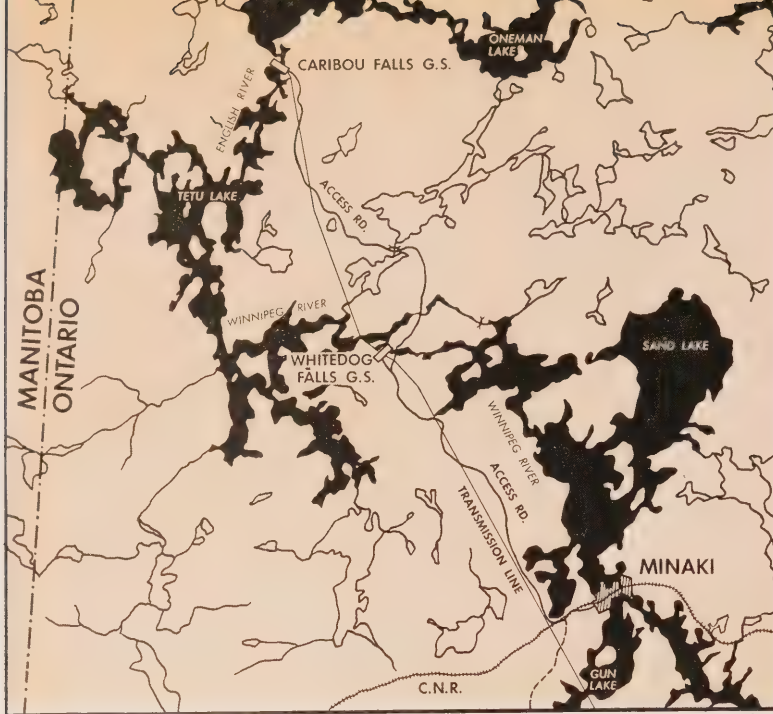
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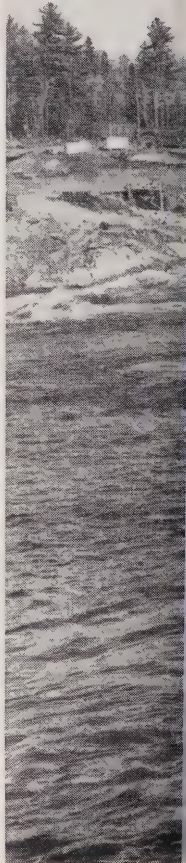
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◀ A VAST system of lakes and streams in northwestern Ontario feeds the Winnipeg and English Rivers, site of Hydro's White Dog and Caribou developments. The map indicates the location of these projects, the necessary access roads, as well as the associated transmission lines and other important structures.

OVERALL view of the White Dog Falls development, looking upstream along the Winnipeg River. During construction of the powerhouse and the greater portion of the main dam, the river will be diverted through the concrete sluiceways on the left. ▶



## WHITEDOG-CARIBOU PROGRESS REPORT

Hydro crews press forward to meet early "in-service" schedule for new developments on northern Ontario's Winnipeg and English Rivers

by DON WRIGHT

# CONSTRUCTION COMMUNIQUE

AN ARMY of more than 1,000 men is locked in a struggle with Nature's forces along a 65-mile front stretching from Kenora in the southeast to a remote area above Caribou Falls on the English River. Included in the ranks of this Hydro contingent are engineers, truck drivers, carpenters and a dozen and more other classifications — armed with an impressive array of equipment, ranging from bulldozers to chain saws, for an onslaught against two rampaging rivers barricaded behind a formidable expanse of forest, lake and muskeg. Victory is reported to be in sight, and with the capitulation...





lation of the Winnipeg and English Rivers at Whitedog Falls and Caribou Falls within the next two years, some 129,000 kilowatts will be released throughout the northwestern areas of the province.

In the vanguard of the Hydro army, surveyors and geologists plotted the best possible location for initial operations, and in the autumn of 1955 a beachhead was established at Whitedog Falls on the Winnipeg River, 30 miles northwest of Kenora. Temporary field headquarters were set up, and during the following winter and spring a vital, 16-mile supply line was blasted

and bulldozed between a new railway siding at Pistol Lake (on the main transcontinental C.N.R. line) and the campsite. The position at Whitedog Falls had hardly been consolidated late in April of this year when orders were received to extend the front to include Caribou Falls on the English River, some 40 miles northwest of Kenora. Landing craft and barges, loaded with men and equipment, were soon plying the 20-mile stretch of water between these two points, and once again a foothold was established without undue difficulty.

Since the completion of the access road that now links Whitedog Falls

with the Pistol Lake depot and the nearby Village of Minaki, the project campsite has become a full-fledged, modern community. While the two projects are, in many respects, separate entities, considerable inter-relationship does exist between these important hydro-electric developments. There is, for example, a continuous interchange of personnel; common supervision at some levels; engineering work such as river improvements — affecting both projects, and a concentration of accounting, catering, school and hospital facilities at Whitedog Falls.

*(Continued on Page 4)*





△ THESE Hydro engineers (left to right): Chester Jones, General Superintendent; William Reynolds, Field Project Engineer, and John Leighton, Construction Manager, are co-ordinating field construction and engineering for both developments.

SPECIALISTS in cofferdam work are engaged in completing the last three sections of the Whitedog downstream structure. A wing wall of the main dam is also visible, top centre.



When this representative of *Ontario Hydro News* visited the dual projects early in October, the work force, headed by Construction Manager John Leighton, was deployed approximately as follows: Whitedog Falls — 575; Caribou Falls — 200; slashers scattered throughout the headpond area of Caribou Falls — 300; outlying road and transmission line crews, including Pistol Lake depot — 280, and construction staff at Kenora Switching Station — 50. Chester Jones, General Superintendent, and W. M. Reynolds, Field Project Engineer, are co-ordinating construction and field engineering for the two projects.

#### Prefabricated Steel Building

The extensive use of steel exterior sheeting for such purposes as camp dormitories, warehouses, cafeteria, garage — even for most of the colony houses, has imparted a utilitarian outward appearance to the Whitedog Falls colony that belies the snug, weatherproof nature of

the temporary buildings. This patented method of construction, utilizing interlocking steel panels, has been used more extensively than ever before at a Hydro project, since it incorporates such important economies as high recovery value and easy erection. At last count there were 90 families at Whitedog in 60 trailers and 30 houses. For those preferring houses, a new system of payment has been worked out whereby the employee rents all necessary material from the Commission and is assessed on a weekly basis, including a small charge for water, sewer, roads and other services. Under this system, the tenant acts as his own contractor and his house reverts to the Commission at the end of his occupancy. Accommodation for almost 500 men is provided in dormitories and staff houses.

Self-sufficiency is a prime requisite at Hydro construction camps, far off the beaten path, where isolation must be regarded as an enemy

ever-ready to hold up progress, and to block off outside assistance in the event of an emergency. The facilities provided at Whitedog Falls, including a 10-bed hospital equipped for minor surgery; a modern, three-room school where instruction is provided for children in grades 1 to 10; a commissary with everything the corner grocery store has to offer, plus such niceties of town life as a barber shop, post office and self-serve laundry are in striking contrast with their primeval surroundings.

A full crew of carpenters is presently at work rushing a fine new recreation hall to completion in time for the Christmas festivities. Bowling alleys, snack bar, badminton courts, lounge and billiard room will be among the attractions of this community centre where regular movies and dances will also be held. Aside from these man-made diversions, camp personnel have some of the finest hunting and fishing territory in all Canada at their disposal.



PREFABRICATED steel buildings are a major innovation at the Whitedog colony. In the centre foreground, work is underway on the large recreation hall, which is scheduled for completion before Christmas. Dormitories and staff houses provide accommodation for almost 500 men.



to enliven their leisure hours. While the camp is accessible only by railroad and by truck or taxi from Minaki, aircraft can be chartered for the 20-minute flight to Kenora. This practice is popular, particularly on holiday weekends, with financing on a share-the-cost basis.

The importance of substantial, well-prepared meals is never underestimated, and probably at no other Hydro project has the problem of feeding and provisioning been more complex. The entire operation is controlled by a central warehousing and purchasing division at Whitedog Falls where provisions, brought in by carload lots, must be transhipped by truck, boat or plane to Caribou, 10 outlying camps and dozens of small encampments where clearing operations are in progress. At Whitedog Falls, itself, the cafeteria is capable of accommodating 360 men at a single sitting, while its bake shop can produce, in a single week, 5,000 loaves of bread, 700 pies and 450 dozen buns.

According to schedule it will be possible to deliver construction power to the Whitedog site from Kenora before the end of the present year. Meanwhile, all camp lighting and construction equipment, including such heavy loads as the crushing and concrete-mixing plants, air compressors, and the pumping units used to dewater the cofferdam enclosure, have been supplied from a temporary powerhouse. Two diesel generators, with a combined capacity of 1,500 kilowatts, supply power for distribution throughout the camp.

Actual work associated with the Whitedog development is progressing according to schedule. Transmission line crews, working in country accessible, in most cases, by boat and a road, carved out of the dense bush from the nearest lake or river, have completed steel tower construction and commenced stringing of the 30-mile line between Kenora and Whitedog Falls. Tower footings have been completed in the

11-mile stretch between Whitedog and Caribou Falls. These 115,000-volt transmission lines will carry power from the two generating stations to a switching station recently completed on the northern outskirts of Kenora. The operation of the generating stations at Whitedog and Caribou Falls will be remotely controlled from the Kenora Switching Station, from which point, the output of the two generating stations will be fed into the Northwestern Division.

In spite of poor weather conditions, which have prevailed through most of the summer, considerable progress has been made at the Whitedog power site since the completion of the pilot stage of the access road early in January this year. A diversion channel, involving the excavation of 20,000 cubic yards of earth and rock was first completed along the north shore of the river on Whitedog Island. Protected by a natural rock plug at the upstream entrance and a short cofferdam downstream, this work, and the subsequent pouring of five sluice piers in the diversion channel, were carried out in the "dry." The plug was then blown out, and the river diverted through the piers so that cofferdamming could commence in the main channel.

At present, both cofferdams have been completed, the enclosure dewatered, and while excavation is taking place in the powerhouse section, construction will commence on an additional five sluice piers — all within the dewatered area. The timber-crib, rock-filled cofferdams stretch from the south bank of the river in the form of a "U" with the most southerly of the first five sluice piers completing the enclosure. To date, approximately 17,000 cubic yards of concrete have been poured in the diversion piers and in the south wing wall. A total of 83,500 cubic yards will have been poured before the Whitedog project is complete. Earth and rock excavation at the power site will total

*(Continued on Page 6)*



CATERING for the Whitedog-Caribou staffs is a complex, exacting task. These bakers can turn out 5,000 loaves of bread a week.



approximately 60,000 cubic yards, one-third of which has already been completed.

Because of the dearth of suitable granular material in this area, a quarry site was located a half mile from the power site and a crushing plant, capable of turning out as much as 250 tons of crushed rock an hour was set up. The concrete-mixing plant is located adjacent to this crusher, and has a capacity of some 50 cubic yards an hour. The concrete is transported in three-ton trucks to the construction site where it is transferred to a "pump-crete" machine and delivered to the forms in this manner. It is estimated that a half-million bags of cement and 125,000 tons of aggregate will be required for Whitedog concreting operations.

Upon completion, the Whitedog structure, including the gravity sections, the sluiceway section, containing nine sluices, and the powerhouse will extend for 1,200 feet across the south channel of the Winnipeg

River. From bed rock to the top of the headworks, it will reach to a maximum height of 110 feet. With an operating head of 50 feet, the three generating units will have a dependable peak capacity of 54,000 kilowatts, scheduled for initial service in December, 1957.

Fairly extensive river improvements will also be carried out at both projects. Three miles upstream from the Whitedog powerhouse, a 30,000-cubic yard excavation in the river bed is proposed to improve regulation of the Winnipeg River and the Roughrock — Sand — Gun Lake system. Additional rock excavation is proposed at Boundary Falls at the outlet of Tetu Lake, this lake being the confluence of the English and Winnipeg Rivers. Here, some 25,000 cubic yards of rock will be removed in order to lower the tailwater level at both Whitedog and Caribou Falls — and thereby increase the operating head at both plants.

At Whitedog Falls, the north



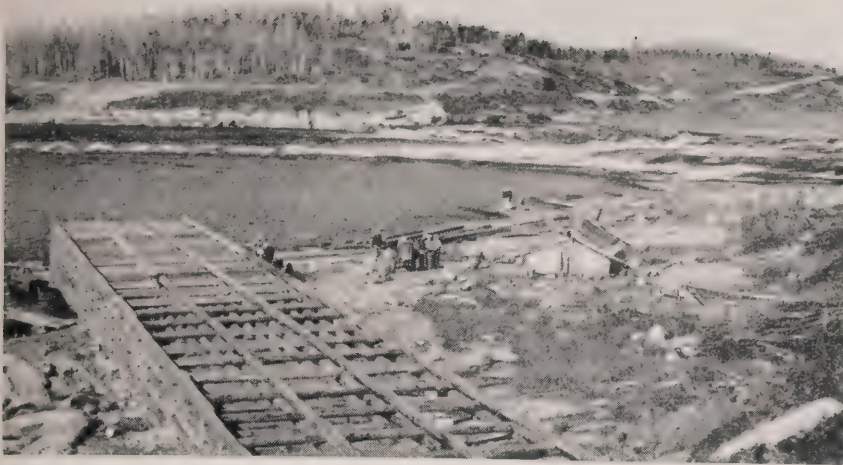
AN AERIAL photographer recorded this view of the Caribou Falls site in July this year. The vast shoreline of Umfreville Lake in the background indicates the clearing operations necessary to permit flooding for the development. Visible progress at this time was confined to the landing dock (right foreground) and the roadway to the site of the Caribou

channel around Whitedog Island will be blocked off by a rock and earth dam. Other block dams will be required both here and at Caribou to build up low spots in the headpond areas. Much farther afield, but still to the advantage of the Caribou Falls development, initial investigations have been carried out for the diversion of Lake St. Joseph into Lac Seul and hence down the English River. This project will augment the flow in the English River system. Hydro's generating stations at Ear Falls and Manitou Falls on the English River, some 100 miles upstream from the Caribou Falls project, will also benefit from this additional water, as will The Manitoba Hydro-Electric Board plants on the Winnipeg River.

### Caribou Project

Progress at Caribou Falls is, of course, less advanced, but considering the recent authorization date of this project a great deal has been accomplished. Personnel are pres-





△  
COFFERDAM construction is now underway at the Caribou project. Dewatering of the river bed, to permit powerhouse and dam construction "in the dry," is scheduled for March, 1957. Much of the timber used in these cofferdams is being reclaimed from nearby clearing work.

ently housed in a temporary but comfortable and self-contained tent city on the west bank of the river, from which point they commute by boat for work on the permanent campsite and cofferdams now rapidly taking shape on the opposite bank. Long sections of cofferdam cribwork now extend into the river and the schedule calls for dewatering to commence early in March of 1957. Already a garage, small parts warehouse, gasoline depot and nine steel-sheathed dormitories, each capable of accommodating 40 men, are under construction on the permanent campsite, and top priority has been given to cafeteria and kitchen construction. It is anticipated that the first meal will be served here during December this year, and the first families are expected to move into Caribou Falls before the end of the coming winter.

It is a tribute to the daring and skill of the river crews and to the ingenuity of the construction forces that such progress was achieved be-

fore the access road from Whitedog Falls had been pushed to completion. Every piece of equipment, from power shovel to air compressor, moved by barge through the 20 miles of fast, serpentine river, which provided the only means of travel between the two projects. The road crews have, in the meantime, won their battle against time. The pilot stage of the 17-mile access road between Whitedog and Caribou has been completed and heavy equipment will be on the move as soon as cold weather hardens the surface of this new route.

#### Two-Stage Program

No diversion channel excavation will be necessary at Caribou Falls, where a two-stage cofferdam program is planned. In the first stage, sluice piers will be constructed near the centre of the river channel, while work progresses on the main dam and powerhouse near the east shoreline. Upon completion of the piers, a section of the cofferdam will be removed and the river per-

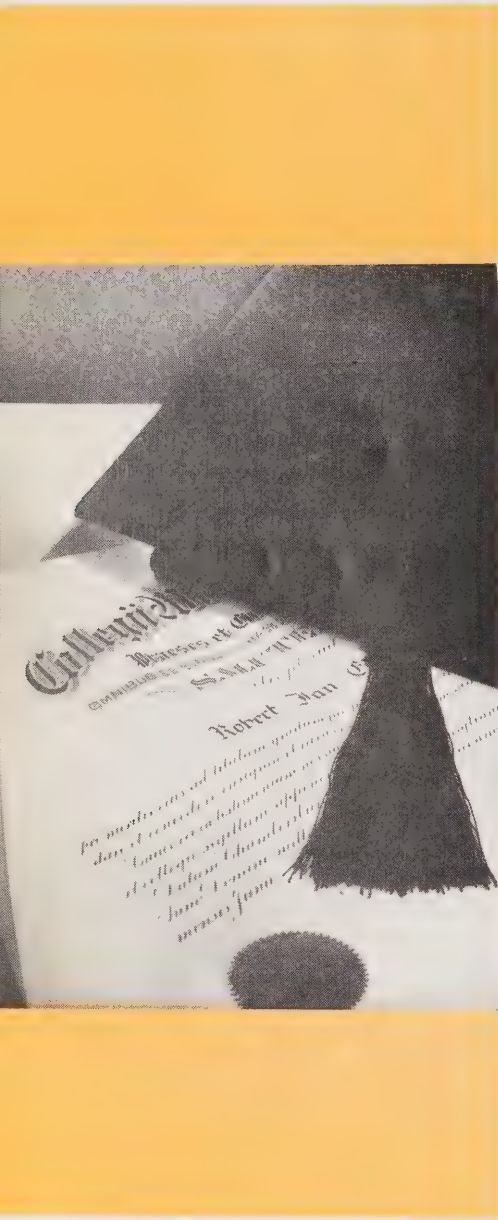
mitted to flow between the piers. Work will continue in the powerhouse section, and, at the same time, the second cofferdam stage will get underway from the west bank where further sluiceways will be constructed, which, together with a bulkhead section will complete the dam. Total length of the concrete structure will be 1,260 feet, while an extension will be formed along the eastern end by an earth dam.

At Caribou Falls, obtaining suitable aggregate for road and dam construction has presented a serious problem. According to geologists, gravel beds are formed by the action of ancient, swift-flowing rivers and because the entire project area was, at one time, a huge lake, deposits found there are very fine — mostly clay and sand. At Caribou, because of the lack of suitable aggregate material, it has been decided to set up the crushing plant presently installed at Whitedog, to process the rock as it is excavated from the power site. A study has indicated that this procedure will be more economical than its only alternative — shipping aggregate from Whitedog.

Clearing operations on an unprecedented scale are another unusual aspect of the Caribou Falls project. Because the available fall, which contains a series of rapids, must be concentrated at one point, more than 20,000 acres will be flooded and it will be necessary to clear this land. At present more than 300 slashers, working in crews of two to five men, are scattered throughout the headpond area, each crew under individual contract with the Commission. So extensive and isolated are these operations that the progress of each crew must be measured by aerial photography.

Their progress is one of the essential elements of a closely-coordinated construction schedule for this 75,000-kilowatt, three-unit development, which, with an operating head of 58 feet, is destined to come into initial service in December, 1958. ■

# ONTARIO HYDRO Scholarships



**P**RESENTED as a tribute to distinguished achievement in the engineering and technical professions and as a stimulus to enrolment in university and other courses related to these fields, 11 Ontario Hydro scholarships were awarded to students at three Ontario universities and three other educational institutions this year.

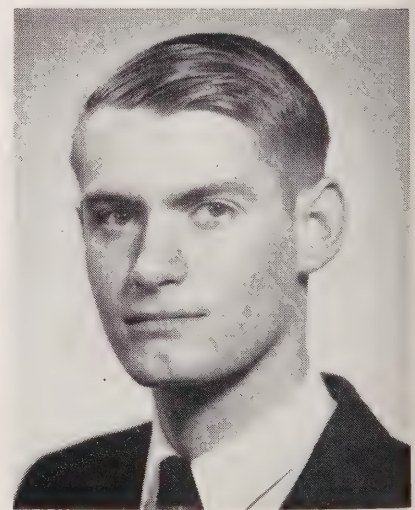
Inaugurated in 1952, the Ontario Hydro awards for 1956 were presented to students registered in courses relating to the operations of the Commission.

This year the Commission presented two, \$300 awards at the University of Western Ontario, London. One scholarship was presented in 1955, following completion of the first year of an engineering course inaugurated in September, 1954. For the year 1957, Hydro has approved that three scholarships be awarded, each with a value of \$300. This year's University of Western Ontario winners were:

*First year—Gerald K. Vanslyke  
R. R. 2, Dorchester, Ontario.  
(Mechanical Engineering)*



GERALD K. VANSLYKE



ROSS LEONARD JUDD



*Second year*—Ross L. Judd,  
487 Baker Street, London, Ontario.  
(*Electrical-Mechanical Engineering*)

For the fourth successive year, a \$300 scholarship has been presented at Port Arthur's Lakehead Technical School in support of the training being given in the school's applied science course. The scholarship, awarded on the basis of academic standing and need, was presented to:

Lynden E. Erickson,  
1108 Sprague Street, Fort William,  
Ontario.

At the Ryerson Institute of Technology, Toronto, where Ontario Hydro presents a \$100 scholarship in the second year of a three-year course in the Institute's School of Mechanical and Industrial Technology, the winner this year was:

Kenneth Major,  
Thorndale, Ontario.

Based on the final standings for the first, second and third year's work of students taking any engineering course related to the Commission's operations, three scholarships of \$300 each were awarded at Queen's University, Kingston, and the University of Toronto.

This year's winners at Queen's University were:

*First year*—Trevor M. Luke,  
4551 Old Orchard Avenue, Montreal.  
(*Engineering Physics*)

*Second year*—Richard A. Morrow,  
174 Napier Street, Kingston.  
(*Engineering Physics*)

*Third year*—Paul H. Weiland,  
64 Glenview Drive, Stoney Creek.  
(*Engineering Physics*)

At the University of Toronto, the Hydro Scholarships were awarded to:

*First year*—William F. McGee,  
Thistletown, Ontario.  
(*Engineering Physics*)

*Second year*—  
Kenneth J. Merklinger,  
198 Simeon Street, Kitchener.  
(*Electrical Engineering*)

*Third year*—David R. Madill,  
75 Bude Street, Toronto.  
(*Aeronautical Engineering*)

The \$100 scholarship presented to the most worthy cadet at the Royal Military College of Canada, Kingston, entering his fourth year of the electrical engineering course has been awarded to:

Cadet Joseph A. M. Hunt,  
76 Albert Street, London, Ontario.

## GERALD K. VANSLYKE

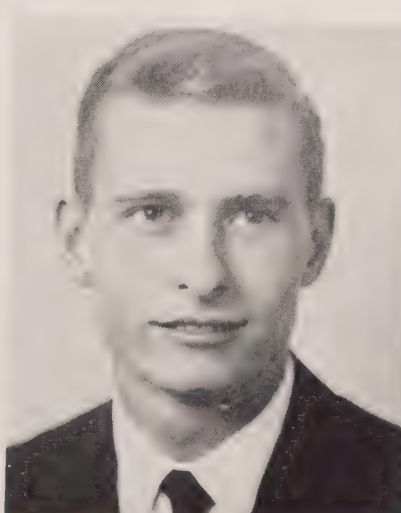
Achievement of Gerald K. Vanslyke, son of Mr. and Mrs. Harold Vanslyke, Dorchester, Ont., in attaining highest standing in the examinations of the first year engineering course at the University of Western Ontario, has gained the first-year Ontario Hydro scholarship. Born in Dorchester on August 13, 1936, Mr. Vanslyke received his education at Dorchester and at the Sir Adam Beck Collegiate, London. He won a university scholarship awarded by the Board of Governors of the University of Western Ontario last year. A member of the Key Club, a Kiwanis Club affiliate. Mr. Vanslyke's other interests include baseball and badminton.

## ROSS LEONARD JUDD

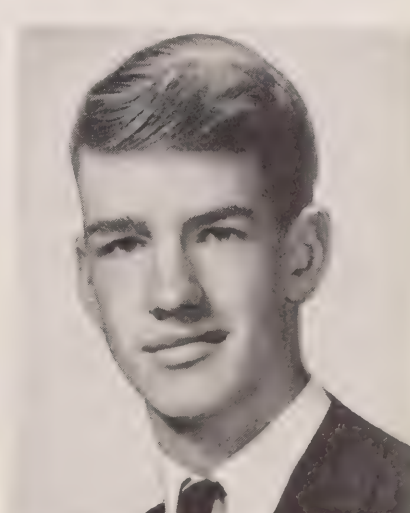
Ross Leonard Judd, who gained the honor last year of winning the first Commission scholarship awarded at the University of Western Ontario, London, has capped this achievement by attaining the highest marks in the second year of the Electrical - Mechanical Engineering course, and has again been awarded a Commission scholarship. The son of Mr. and Mrs. Frank E. Judd,  
(*Continued on page 10*)



LYNDEN E. ERICKSON



KENNETH EDWARD MAJOR



TREVOR MacDONALD LUKE

London, he was educated at the Tecumseh Avenue Public School and the London South Collegiate Institute, entering the University of Ontario in 1954 with a scholarship in mathematics. Associated with the 11th London "Rover" crew of Scouts, Mr. Judd also enjoys table tennis, hunting and cabinet making.

#### KENNETH EDWARD MAJOR

Kenneth E. Major, winner of the Commission scholarship awarded at the Ryerson Institute of Technology is the son of Mr. and Mrs. J. E. Major, R. R. 3, Thorndale, and was born in Woodstock on November 5, 1936.

Obtaining his primary and secondary education at West Nissouri and the St. Marys District Collegiate Institute, he gained a Canadian General Electric Company scholarship for general proficiency. He is rated as a very promising student by the Ryerson authorities, who anticipate that he will graduate in the General Mechanical course in 1957.

Actively interested in baseball, rugby, basketball and track and field sports, he was a member of the track and field championship team at high school.

#### LYNDEN E. ERICKSON

Gaining first class honors in all subjects in applied science, Lynden E. Erickson has been awarded the Commission scholarship at the Lakehead Technical Institute, Port Arthur.

Born at Fort William on June 6, 1938, he is the son of Mr. and Mrs. John Erickson, Fort William. Mr. Erickson received his primary and secondary education at Fort William, gaining the Northern Engineering Prize in 1954. This student entered Queen's University this fall to continue his studies in engineering physics.

#### TREVOR MacDONALD LUKE

Trevor M. Luke, son of Mr. and Mrs. L. M. Luke, Montreal, winner of the 1956 first-year Commission scholarship at Queen's University, was born at Montreal on March 26, 1937. Obtaining his primary and secondary education at Willingdon School and Lower Canada College, he entered Queen's on a provincial entrance scholarship, having previously gained a Lieutenant-Governor's medal.

A member of the Mathematics and Physics Club and class vice-

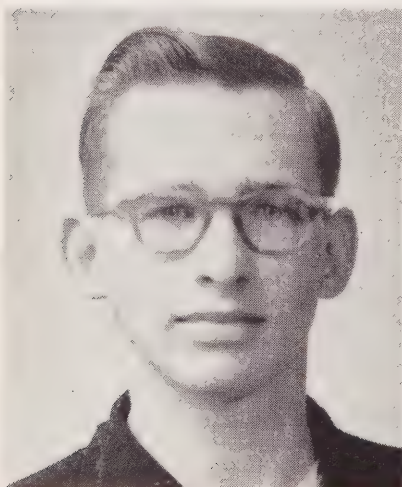
president, Mr. Luke is also interested in sports and participates in handball, hockey and swimming.

#### RICHARD A. MORROW

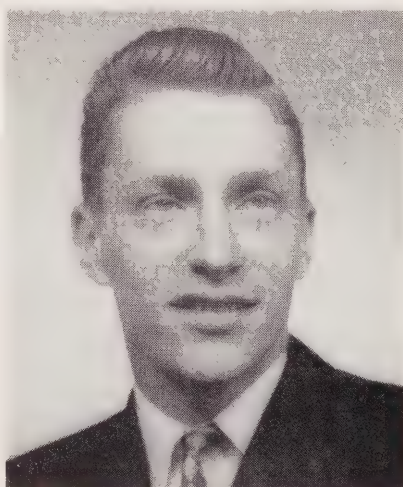
Richard A. Morrow, winner of the second year scholarship at Queen's and described as one of the ablest students in his group, was born on April 19, 1937 at Powassan, Ontario. The son of Mr. and Mrs. Alexander Morrow, Kingston, he received his primary education at Stratford and Oshawa and secondary at Oshawa and Kingston Collegiates. In the last three years he has gained the Watkins, Robert Bruce, N. F. Dupuis and the Association of Professional Engineers of Ontario scholarships. During the summer this year he worked with the Commission's meter and relay department at Belleville.

#### PAUL HENRY WEILAND

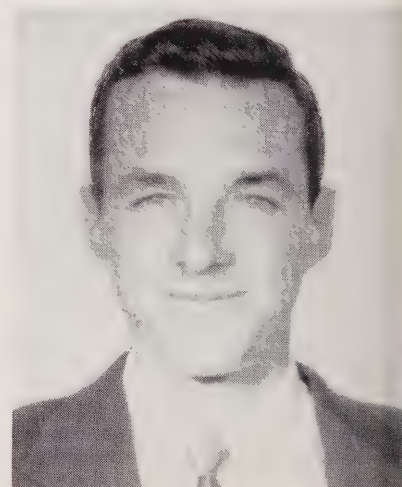
The third-year Hydro scholarship at Queen's University has been awarded to Paul H. Weiland, who has completed the third year of the course in Engineering Physics. Born in Toronto on July 18, 1932, he is the son of Mr.



RICHARD A. MORROW



PAUL HENRY WEILAND



WILLIAM FREDERICK MCGEE



and Mrs. Henry Weiland, Stoney Creek. Receiving his primary and secondary education at Hamilton Memorial School and Delta Collegiate Institute, he gained an Association of Professional Engineers of Ontario Scholarship last year. Mr. Weiland is a student member of the Association of Professional Engineers of Ontario, as well as of the Engineering Institute of Canada. Actively interested in sports, he plays softball, golf and tennis, and during last summer worked for Ontario Hydro's Stoney Creek Rural Operating Area.

#### WILLIAM FREDERICK McGEE

Achieving second standing in a group of 105 students in Engineering Physics, and gaining honor marks of 86 per cent, W. F. McGee has been awarded the Hydro scholarship available to a first year student in engineering at the University of Toronto.

Born in Toronto on January 16, 1937, he is the son of Mr. and Mrs. W. S. McGee, Thistle town, and received his education at Leaside and Weston, gaining a science award at Weston High School.

Besides participating in football

and basketball, he was a member of the Weston Senior High School Rugby championship team in 1954.

#### KENNETH J. MERKLINGER

Second-year student in the Electrical Engineering course at the University of Toronto, Kenneth J. Merklinger gained first standing in a group of 59 with honor marks of 87 per cent and has been awarded a Commission scholarship.

Born in Kitchener on June 6, 1935, he is the son of Mr. and Mrs. John Merklinger, Kitchener, and received his primary and secondary education at Kitchener, gaining the Grand Valley Engineers' Memorial Award on entering university.

Keenly interested in student activities, he is secretary of the Toronto Student Branch of the A.I.E.E., a member of the Men's Residence Council, the Hart House Bridge Club, the Gamma Delta Lutheran Student Fraternity, and during his high school days was a member of the champion curling team.

#### DAVID ROY MADILL

The third-year Hydro scholarship at the University of Toronto has been awarded to David R. Madill.

Toronto, a son of Mr. and Mrs. Herbert Madill. Born in Toronto on January 21, 1935, Mr. Madill was educated at Vaughan Road Collegiate Institute. He took part in intramural sports both at high school and university, and is interested in basketball, swimming and rugby. Mr. Madill in third year aeronautical engineering gained second standing and honors with a percentage of 88 in the 1956 examinations.

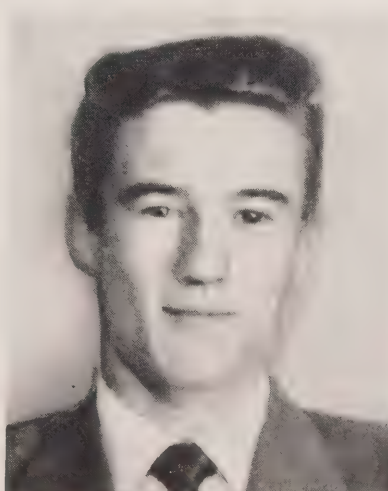
#### JOSEPH A. M. HUNT

Joseph A. M. Hunt, winner of the Commission scholarship awarded to the most worthy cadet entering his fourth year of the electrical engineering course at the Royal Military College of Canada, Kingston, is the son of Mr. and Mrs. David Hunt, London, Ontario.

Born at Markdale, on August 27, 1935, Cadet Hunt received his primary education at Elmwood and his secondary education at the District High School, Chesley. While he plays baseball and basketball, his special interests are electronics and flying, and during the summer he was training as a navigator with the Royal Canadian Air Force at Winnipeg.



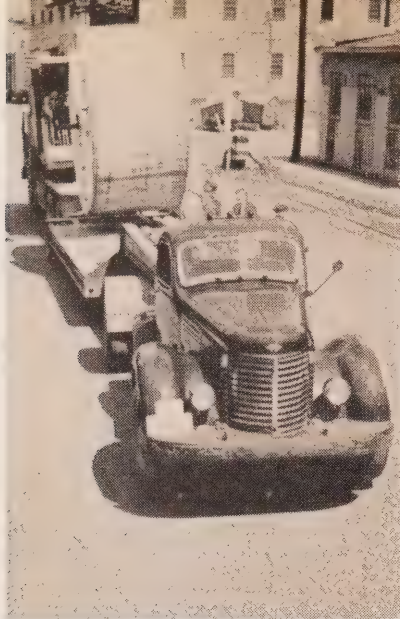
KENNETH J. MERKLINGER



DAVID ROY MADILL



JOSEPH A. M. HUNT



CABLE drums, averaging 8 to 10 tons each, are transported on special, low-bed floats.

# PATHWAYS TO POWER

## Chapter VII: HIGH VOLTAGE CABLES

by J. E. Sproule \*

**I**NCREASING world-wide application of electricity to industrial and domestic use emphasizes the necessity for the most economical transmission of power. Hydro-electric stations, and sometimes thermal - electric plants, may be at a considerable distance from the industrialized centres which they serve. Consequently, the problem of transmission at higher voltage has become of great importance. Particularly is this the case where rights-of-way are restricted and expensive. In such instances, it is often necessary to install high voltage underground cables.

The "solid" type cable has inherent limitations. Small spaces tend to form in the insulation as it cools off after a rise in temperature. The gas in these voids ionizes, causing gradual deterioration. Long runs of solid type cable have proved uneconomical at 34,000 volts and impracticable for higher voltages.

Oil-filled and gas pressure-type cables have been developed to overcome the migration of compound and the resultant voids. In the oil-filled cable this is accomplished by means of reservoirs. Stop joints are required between sections supplied by different reservoirs, and special terminating equipment is used. The

oil must be thoroughly degasified. In the gas pressure-type cables, the inert gas acts on the lead sheath of the individual conductor or is in contact with the insulation.

### Mechanical Protection

Mechanical protection against damage to the cable circuit is all-important in industrial areas and the choice is limited to a pipe-type or duct bank installation. The duct bank consists of cable conduits encased in a concrete envelope and gives ample mechanical protection, but it does not have the flexibility of the pipe type.

### *Typical Pipe-type Cable Installation*

**Trench Excavation** — A normal depth of trench is 3 feet 6 inches. For thermal reasons a minimum cover of 30 inches is required.

**Preparation of Pipe** — The steel pipes are cleaned, coated and tested at the manufacturer's plant. This consists of shot blasting the inside to assure a clean and smooth surface that will not damage the cable when it is being pulled through. The inside is then coated with some "no-oxide" preparation for prevention of rust. The outside is coated with a

bitumistic compound for protection against corrosion. Pipe lengths are submitted to pressure tests and then shipped to the site convenient to the job. They are in random lengths, approximately 40 and 42 feet long, with ends suitably bevelled for welding. Each end of the pipe has a waxed wooden plug inserted to prevent moisture entering while in transit.

**Laying of Pipes** — As the excavation proceeds, timbers are laid across the top of the trench at short intervals and the pipes laid out butt to butt between cable joint locations, a distance usually between 700 and 1,000 feet. At joints, the bevelled pipe ends are fitted with a tapered chill-ring to provide a smooth inside surface and prevent the formation of internal welding ridges, which would damage the cable as it was being pulled in.

Welding is carried out over the open trench. Each joint is tested for leaks by charging the completed section of pipe between cable joint bays with nitrogen gas at 100 lbs per sq. inch. For testing, temporary flange plates and valves are fitted

\*(Mr. Sproule is Consulting Transmission Engineer, Ontario Hydro.)



to the pipe ends at cable joint locations. A shaped water bath is placed around each pipe joint. Any leak from the weld will be detected by a stream of gas bubbles.

When the bare metal exposed for welding has been re-covered, the entire coating from one joint bay to another is tested for "holidays" by means of a circular wire brush, moved slowly over the surface. A test voltage of approximately 10,000 volts, supplied from a small portable rectifier unit, locates any faults in the coating due to inferior wrappings or damage in transit. These faults are repaired immediately.

Lowering the pipe into the trench requires special care and equipment. When the pipe has been lowered on a bed of sand, more sand is laid around and over it to a depth of 3 inches, followed by excavated soil.

### Introducing Cable

The moving of cable drums must be carried out with care. Each drum averages 8 to 10 tons in weight, and requires the use of a special low-bed float.

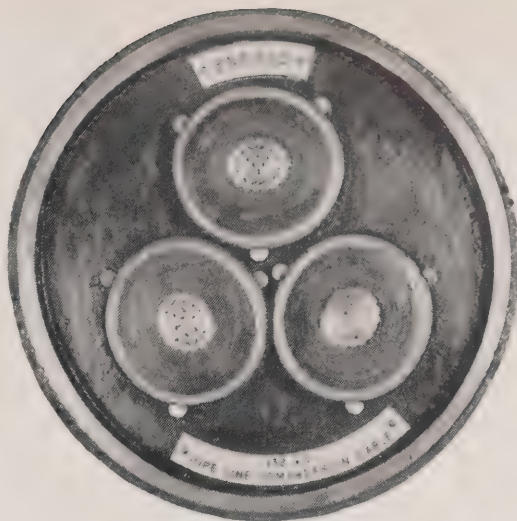
Before the cable can be pulled into the pipe, a pulling-in wire is run through. A pilot head attached to a wire is blown through the pipe between joint bays by compressed nitrogen gas or air. A pulling-in eye is attached to each of the three cables in order that the tension may be evenly distributed. A power-operated winch pulls in the cable, which is given a lubricating application of soft soap as it enters the pipe.

### Cable Joints

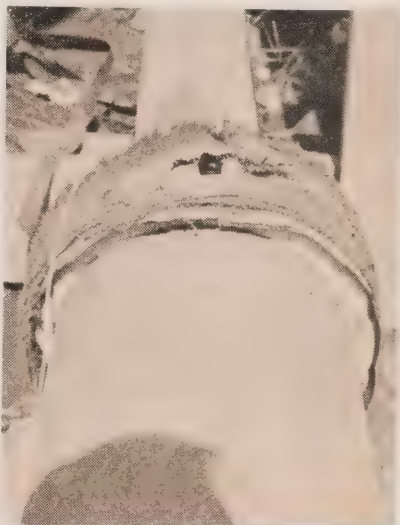
Before jointing, the cable ends are protected by means of a sleeve which slides over the pipe flanges and is sealed against moisture intrusion by means of thick flax tape heavily impregnated with petroleum jelly. Precautions must be taken to ensure that the joint bay is adequately protected against dust and water.

The two ends of the cable are cut

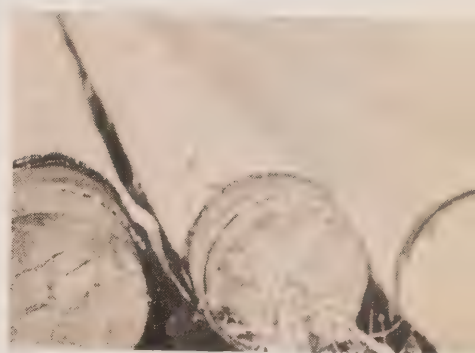
*(Continued on Page 14)*



△ CROSS-SECTION of a typical gas pressure-type cable, which is used in some underground installations.



△ TEMPORARY joint seal after the cable has been pulled through, but before splicing.



△ WAXED wooden plugs are fitted into both ends of pipes to prevent moisture from entering while the pipes are in transit.



△ TYPICAL joint bay showing the jointing sleeve in position over the pipe.



△ IN some cases, Hessian tapes are placed on the cable for transportation. These are removed before the cable is pulled through the pipe.

to enable them to butt together. For a gas-filled cable medium, the lead sheath is removed to the required length of the joint sleeve and the paper insulation is removed from each butt to expose the copper conductor. After trimming down to size, a copper ferrule is added, and the conductors are joined together by compression or sweating.

The insulation is very carefully built up by hand-wrapping from the ferrule with impregnated paper tapes. When lead-covered cables are used, a jointing sleeve slides over the completed work. The ends are trimmed down to the cable sheath and sealed. The sleeve is then filled with cable oil through plug holes in the joint sleeve.

Each single cable joint takes an average of 12 hours to complete. On a 3-phase joint, jointers work in shifts for a 36-hour period, no break in work being permitted.

The final operation is to weld the outer steel sleeve on to the flange ends of the pipe, thus enclosing the three single joints permanently within the pipe.

The finished joint is an enlarged section of the pipe. It is anchored to a concrete mat, which forms a dry unrestricted area in which to carry out jointing operations.

### Types of Joints

There are three types of joints required for a pipe-type cable installation — the straight-through joint, as described above; trifurcating joints and sealing ends. A trifurcating joint is located near each termination and makes provision for the three separate electrical phases to leave the pipe, as separate cables. Each of the cables is either a self-contained gas-compression type or pipe-type oil-filled and terminates at the sealing ends.

The sealing end is the true cable termination and forms a means of connection between the cable circuit and overhead line. It is contained by a heavy cone-like casing made of glazed porcelain.

Depending on the pressure medium, the ancillary equipment is connected to the pipe. In the case of a gas medium, the equipment comprises a control box to which a nitrogen gas cylinder can be connected when required. Where oil is the pressure medium in a pipe-type cable system, operating at 200 p.s.i., the terminal equipment comprises a 1,000-gallon oil reservoir, pressure pump, valves, pressure gauges, etc., housed in a brick building.

### *Installation of a Pirelli Type Low Pressure Oil-filled Cable in Duct System and Manholes*

A typical installation in the placing of two, 3-phase circuits of 115-kv. cable between two transformer stations in fairly close proximity, can be found at Beach and Kenilworth stations in Hamilton. The cable consists of six single-conductor (three conductors per circuit), Pirelli-type, low-pressure oil-filled cables, with the conductors installed in a nine-way duct system with manholes. The system can accommodate the six 115-kv. cables leaving three spare ways for communication cables or an additional circuit.

The cable is supplied in lengths of not more than 900 feet and the joints between the sections are made in manholes, which are permanent concrete vaults below ground level large enough to allow two or three men to work around the joints.

The duct bank consists of 9, four-inch (internal diameter) asbestos cement ducts encased in a concrete envelope.

The ducts are spaced at a distance to minimize the damage that might be incurred if an electrical cable fault developed in an adjacent duct and to permit heat transfer from the loaded cables to the surrounding soil — an important factor in the load-carrying capacity of the cable. A minimum three inches of concrete envelope is cast around the ducts to protect them from external mechanical damage.

The manholes are of reinforced concrete, the roof being designed for the maximum vehicular wheel load likely to be encountered and the walls for the maximum soil pressures at the relevant depths.

### Preliminaries

Excavation is carried out as previously described for the pipe-type cable except that, wherever possible, a full length of trench between manholes is opened up. Obstructions that might interfere with location or grade can then be avoided before any concrete is placed.

After the trench is excavated and graded, a layer of crushed rock is deposited on the bottom. The nine ducts are now placed in the trench and spaced by means of precast concrete bars, which have the necessary dimensions to ensure the desired separation of ducts.

Ready-mix concrete is poured around the bottom of the ducts, followed immediately by a second and third layer, ensuring a consolidated monolithic placement.

After the initial set has taken place in the concrete, a shallow layer of earth is deposited on the duct bank to assist curing, to be followed 24 to 48 hours later with the complete backfill.

When the duct bank is completed, a test mandrel or cylinder is passed through each duct-way. If the mandrel passes through easily the duct bank is considered satisfactory.

### Cable

The 115 kv. cables are used to transmit a large block of power which will generate heat in its passage. This heat must be transferred to the earth surrounding the duct bank. For this reason only the six outside ducts are used for the power cable. The inner three ducts may be used for communication or other cables.

When the cable is processed at the manufacturer's works, it is filled with oil at low pressure. A pressure tank is incorporated in the drum



upon which the cable is wound for delivery and handling at the job.

The most important fact to be remembered during the installation of this type of cable is that it must be kept under oil pressure at **all times**. Before a cable end is finally cut loose from the drum and its pressure tank, oil must be fed in from some other source so that a positive oil pressure is maintained within the cable.

In this installation a low-pressure oil supply is maintained by gravity type oil reservoirs.

### Connection With Stations

The cable which must remain sealed to maintain oil pressure and prevent ingress of air is connected to the transformer stations through "potheads" or sealing ends, which seal off the oil and paper insulating medium of the cable and permit the central copper conductor, which will be energized at 115 kv., to be connected to the plants.

Each joint and sealing end is subjected to vacuum to remove moisture and as a check for leaks through the plumbing. After vacuum treatment, it is filled with the same degasified oil as the cable. ■

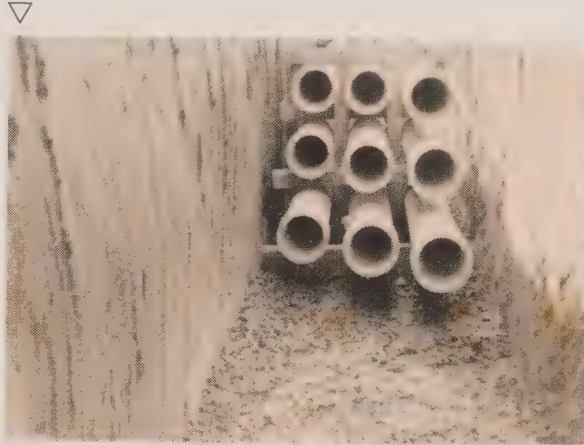


▷ DITCH-DIGGER excavating a trench for the installation of a duct bank.

AFTER grading, a layer of crushed rock is laid on the bottom of trench.



A DUCT bank for 115-kv. Pirelli-type, oil-filled cable consists of four-inch (internal diameter) asbestos cement ducts. The nine ducts are spaced by means of precast concrete bars.



A CONCRETE envelope is poured around the ducts to protect them from external damage. ▷

THE nine-duct bank separates into three-duct banks for the phases of one circuit at the station terminal.





**P**HOTOGRAPHS reproduced on these facing pages have been selected from Ontario Hydro files and the records of several of the 14 Ontario municipal electrical utilities, which signed power contracts with the Commission back in 1908. Running the gamut from construction of Hydro's first major development — now the Sir Adam Beck-Niagara Generating Station No. 1 — to the first main office of the Toronto Hydro-Electric System, these photographs recall varied phases of the colorful history of Ontario's publicly-owned Hydro enterprise.



CONSTRUCTION of Hydro's first major power development (now known as the Sir Adam Beck-Niagara Generating Station No. 1) was well-advanced when this view was recorded on September 1, 1921. Also visible are the tracks of the International Railway Company, which operated an electric line from 1893 to 1932.

# GOLDEN JUBILEE

RECALLING Woodstock's early participation in the Hydro movement is this view of the municipality's first street lighting fixtures 44 years ago. Hydro service was introduced there in November, 1910, and Chairman Adam Beck inaugurated the new street lighting system during 1912.



ARTHUR BABCOCK, line foreman with Galt P.U.C. for some 30 years, drove the commission's original line truck when it was used in a 1919 Old Boys' Reunion parade to encourage the use of domestic electrical appliances. Milton Ricker, another lineman, also participated in the parade with two unidentified lady members of the utility staff.







△  
AT A demonstration dinner in London in 1911, this group (left to right): Alfred Miller, Editor, London Free Press; Philip Pocock, Chairman of the board administering London's electrical services; Hon. Adam Beck, first Hydro Chairman; London Commissioner John Marr, H. G. D. Crerar (later Major General) and Bernard Mulholland, of the Ontario Hydro staff, and H. J. Glaubitz, London, sat down to one of the first completely electrically-cooked meals in Ontario.



△  
BECAUSE of their agility, these Waterloo linemen were known as the "squirrel gang" in 1912. The crew (left to right): Burt Warner, James Walker, William Reiber and Eby Rush posed for this photograph while installing transformers for a new distribution line. Mr. Rush joined the Waterloo staff in 1910 and served as superintendent of the local utility from 1939 to 1955.

## THE ALBUM

THIS 1926 view of Kitchener's first line truck pulling a custom-made trailer recalls the fact that Hydro service actually had its official beginning in that city (then Berlin) back in October, 1910. The group includes Albert Brown, Fred Treasure, Bert Warner and Wm. Smith, members of the line crew.



DECEMBER, 1956



△  
ADMINISTRATION of electrical services was handled by a city department before the Toronto Hydro-Electric System was organized in 1911. The first Toronto office and appliance store was established at 226 Yonge Street.



# WESTON HONORS HYDRO

**E**LECTRICITY is the only commodity in Weston today that costs one-fifth of what it did 50 years ago.

The foregoing statement was an interesting highlight of an address by Weston Commissioner Charles M. Richardson at a gathering of Weston citizens on November 1 marking Hydro's Golden Jubilee. Arranged by the members of the Weston Public Utilities Commission, the anniversary event in the Weston Collegiate Institute and Vocational School, attracted an interested audience of some 500 Weston Hy-

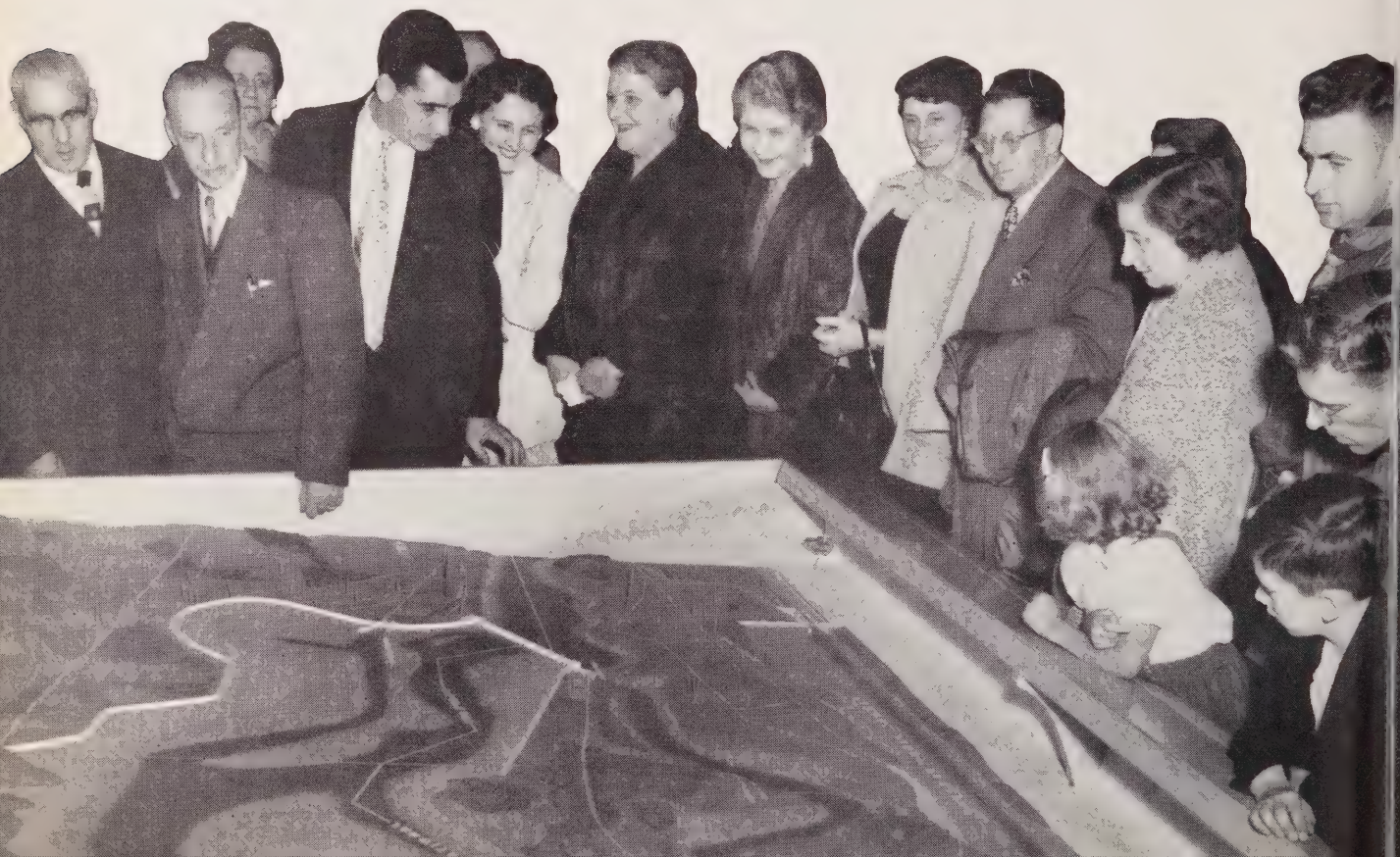
dro customers. With Richard E. Hassard, Weston P.U.C. Chairman, as master of ceremonies, the program was featured by selections provided by the Weston Silver Band.

Participating in the salute to the Hydro anniversary were members of Weston's Town Council, including George Bull, Robert Woods, W. R. Perry, Charles Conroy and Mayor W. Harry Clarke. Representing Weston Board of Education was Mrs. E. L. Norman, Chairman, while Manager Adam Smith, Toronto Region, was Ontario Hydro's

representative. Other platform guests were: Dennis Neville, Weston Kiwanis Club, and Weldon Inch, representing the local Rotary Club.

Mayor Clarke addressed the audience briefly while Rev. R. J. Boggs, President of the Weston Ministerial Association, gave the invocation.

Tracing the history of Weston and the important influence of the Humber River on the community's growth, Mr. Richardson, a longtime employee of Weston P.U.C. and latterly a commissioner, described Samuel de Champlain's trip down





ONTARIO Hydro, Weston civic and service club representatives were platform guests during the Hydro Golden Jubilee celebration.



the river in 1615. In 1792, John Countryman, a member of a band of English surveyors, became impressed with the fine oak and white pine in the area. He settled near the site of the present municipality and named the river after the Humber River near his former home in northern England. Samuel Holley and his son built a grist mill that operated night and day to provision troops during the War of 1812-14. Then James Farr, protesting the fact that so many of the settlements bore the name of Humber, renamed the thriving settlement "Weston," in honor of his English home.

Waterpower contributed to the growth of the thriving community, Mr. Richardson said. Timber, flour, and textile mills, along with a cooperage plant, flourished for many years. Schools and churches were built and one of the first post offices in Upper Canada was established at Weston. River barges, plying between Lake Ontario and Weston, were replaced by the railways in providing transportation for the growing community.

Then, in 1899, Weston took a giant step forward. That year the Chicago World Exposition startled the world with a demonstration of electric lighting. Mr. Richardson pointed out that Weston was not startled, for in that same year, a new thermal-electric plant began generating power. That plant, the

speaker recalled, ran from six o'clock in the evening until midnight. The payment of a small sum—"probably a dollar or two"—was usually sufficient to persuade the plant operator to keep the lights burning for a party, Mr. Richardson continued.

On April 2, 1906, Weston, in company with other Ontario municipalities, passed this important motion: "Whereas cheap power is essential to the success of factories and industries of almost every kind, particularly in Ontario, where coal is expensive, and whereas experience shows that this great natural and national asset would be practically worthless if controlled by private capital, and whereas in our opinion there is no regulation sufficiently effective or possible to be framed whereby power can be obtained from the owners of existing franchises at reasonable rates, therefore, be it resolved that the Municipal Council of the Village of Weston earnestly desires and respectfully asks the Government of Ontario to at once establish a power plant at Niagara Falls, or to secure power from existing franchises, for distribution to reachable municipalities of Ontario, and further that they devise plans to carry the same into effect at the earliest possible moment."

"From this motion," Mr. Richardson stated, "together with the action taken by the other municipalities, has grown one of the world's greatest public enterprises

Ontario Hydro. And it has cost us not one cent in taxes!"

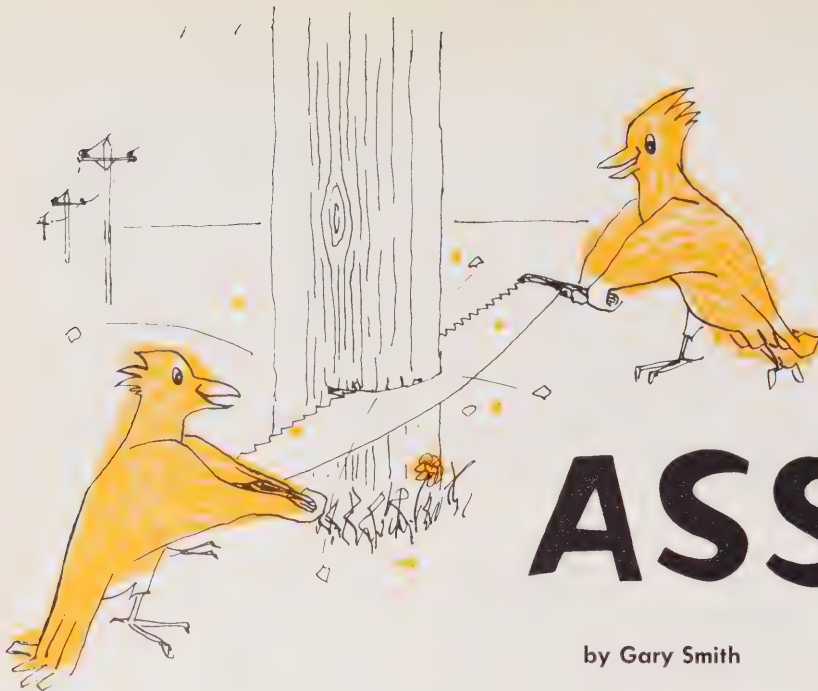
Weston, he said, was an important partner in this development of public ownership. Today, Weston rates were among the lowest in Ontario, and third lowest among the municipalities of Metropolitan Toronto. Out of the family of 343 municipalities in Ontario, Weston was the 15th highest user of power per capita. Ready availability of power had attracted industries to Weston, and contributed to the expansion of its manufacturing plants. The products of these plants, bearing the name of Weston on the

*(Continued on Page 31)*



WESTON P.U.C. Chairman Richard E. Hasard (left), as master of ceremonies, introduced Commissioner Charles E. Richardson, who traced the history of the community.

ON citizens displayed particular interest in the St. Lawrence Power Project model.



# POLE ASSAULT

by Gary Smith

**A**N ANIMATED, oversized pin-cushion that looks like the "before" picture in a hair cream advertisement is public enemy No. 1 to the busy linemen on many of Ontario Hydro's far-flung distribution and transmission lines.

For the porcupine, who likes to make his breakfast off a cedar Hydro pole, is first among a whole motley assortment of nature's denizens, who, each year, try the line maintenance man's temper with a ceaseless assault on poles, wires and posts. There aren't figures to tell the whole story on such culprits as the porcupine, the pileated woodpecker and the carpenter ant, but line maintenance supervisors report a continual skirmishing with creatures who run, fly, crawl, burrow, or like the porcupine, just eat.

When the prickly fellow takes up residence near a Hydro line it's a case of the immovable pole and the irresistible appetite. And many a line patrolman has stopped to scratch his head over a new cedar pole chewed halfway through, mute testimony to the voracity of the porcupine.

The porcupine is difficult to handle and many hunters believe it's not "cricket" to kill him since, in an emergency, he would provide food to anyone lost in the bush.

Beavers, for instance, which occasionally cause a headache by flooding a line right-of-way or dropping a tree across a high tension circuit, can often be trapped and moved to another neighborhood, preferably one not too close to Hydro operations.

The feathered rascal, probably second in nuisance value to the porcupine, is the pileated woodpecker, a large black and white bird with a distinctive brilliant red crest and a penchant for using his "punch-press" beak on Hydro poles. A tap or two and he can usually tell if a pole has an edible content. If he finds a pole to his liking, he punches through the outer layer to the soft interior to get at the insects or whatever has titillated his strange palate. Usually he will keep two holes open in each pole he dines off, and return regularly for meals.

## Sealing Strategy

When line maintenance crews first began noticing his depredations some years ago in northern Ontario, they hit on the plan of sealing up the openings with a hard compound. The woodpecker promptly opened up two more. When the linemen persisted so did the bird. Veteran linemen report having seen a pole with as many as 12 holes in it: 10

of them sealed up and the remaining two still open.

The carpenter ant, a half-inch, "do-it-yourself" fan, doesn't play around when he puts the bite on Hydro equipment. He moves in a drill team and begins a housing project. Working from the inside, the ants ring the pole with galleries and often become so thick the nest weakens and eventually destroys the pole.

Hydro maintenance men can clean out the nest by pumping a poisonous chemical into the pole. This does away with the ants, but if the pole has become so weakened that it has to be removed, another carpenter colony, as often as not, will move into the new pole.

Hydro has achieved at least partial immunity against Mother Nature's pole assault by using various wood preservatives, including creosote and pentachlorophenol, to impregnate the poles before they're used. But, on many lines, western cedar poles are chosen to get the 50-foot height needed on high voltage circuits. This wood is of such good quality that the expensive impregnation process is not needed as protection against the weather.

Many of the thousands of wood poles used by Hydro are either western or eastern cedar and present a





Ontario Department of Lands and Forests Photo

"The porcupine likes to make his breakfast off cedar Hydro poles."

clean untreated surface to the porcupine, woodpecker and carpenter ant alike. Even some of the treated poles will check with age, offering the ants especially an opening past the treated wood into the heart.

Actually, it's the unpredictable quality in wildlife that often wears a thin edge on the Hydro maintenance man's temper. Not too long ago it was discovered that something, or someone, was chewing up the aluminum tie-wire used to fasten the conductor to the insulators near Crystal Falls in northern Ontario. A watch was set up and the outlaw proved to be a porcupine.

Maintenance supervisors do not think the animal liked the taste of

the wire, but believe the soft metal attracted the porcupine as a good material on which to exercise his molars.

Hydro promptly devised a metal skirt, which can be fastened on the butt of the pole near the ground. The device worked because it prevents the porcupine from climbing the pole to a point where he can use the aluminum tie-wire as a teething ring. But the experience convinced maintenance men that some animals just "never grow up."

There's some evidence available that among birds and animals, as among humans, there's a tendency toward developing a neurosis if things "don't go right." Workmen at a Hydro line camp near Alp Lake weren't getting their last hour of sleep in the morning recently after a pileated woodpecker set up a regular dawn patrol on a metal tower within easy hearing distance of the camp.

The linemen tried all available means of scaring the bird away before, as a last resort, shooting it. They think it's obvious the pileated had a mental quirk somewhere. Maybe an unhappy home life.

### Starling Trouble

Hydro engineers have, however, achieved notable success in thwarting one annoying pest at least. The starling, a shiny, black roisterer with the instincts of a street brawler, used to spell trouble for Hydro linemen

with his penchant for clustering on electric wires and pole installations.

Frequently, maintenance supervisors report, one of the birds would commit accidental suicide by grounding a high tension wire and shorting the circuit. It meant that particular starling wouldn't do any more damage, but it also made it necessary for maintenance personnel to do a quick check of the area and replace a burned out fuse.

Hydro men had no trouble tracking down the culprit. The bird's body at the foot of the pole always gave him away. Use of a different type of coupling now prevents the starling, and most other birds, from standing on a transformer box and pecking a "hot" wire. But where such equipment has not been placed in use, maintenance men still report isolated instances of starling trouble.

Nevertheless, Ontario Hvdro's much-travelled line maintenance workers view such antics as more of a nuisance than a major obstacle to keeping lines in service. The same can't be said of the depredations of animals and birds in other parts of the world. In Norway, for instance, bears get a kick out of scrambling up telephone poles and gleefully swaying back and forth until the poles snap.

An electric company in Chile was forced to take action against some ponderous buzzards, who were

(Continued on Page 31)



# LOOKING TO THE FUT

## **PRESIDENT J. T. BARNES SUGGESTS GENERATING STATION IN LAMBTON CO**

A SUGGESTION that Ontario Hydro could conceivably, within the next 10 years, build a thermal-electric generating station in Lambton County was embodied in the opening remarks of President John T. Barnes at the annual convention of District 8, O.M.E.A. this year. Held at the Guildwood Inn, Point Edward, with an attendance of some 85 delegates, it was the association's first autumn convention and the attendance figure was a gratifying feature.

In his inaugural address, Mr. Barnes told delegates that the area embraced by District 8 (including all of Kent, Essex and Lambton Counties) yielded many millions of dollars in exportable goods, which had brought it distinction on the dual basis of diversity and quality. The expanding economy of the district, stimulated by the establishment of new industries in the wake of the St. Lawrence Seaway, would bring greatly increased demands for power.

"As a result of this anticipated growth, plus the known potential loads," Mr. Barnes continued, "we may reasonably expect, within the next decade, that Ontario Hydro will recognize the need for building a generating station of the

thermal-electric type in Lambton County—as the once-countless hydraulic sites in this province are now being developed at a rapid rate. This station could derive its heat from coal, oil, gas or nuclear fission, with the latter taking the place of the conventional fuel-fired boilers."

Stressing that there could be no cessation in plans for the future, the speaker voiced the conviction that the district could no longer risk interruptions in power transmission over long distances. Although the interruptions might be of short duration, Mr. Barnes said they could very easily spell the difference between success and failure to some companies and industries concerned.

"This we must avoid if we are to maintain our position in an ever-growing, competitive market. Power is the yardstick by which a nation's prosperity and standard of living are measured."

Noting that some commissioners had retired, because of age or ill-health, and that others "owing to the wishes of the electorate are obliged to step aside," Mr. Barnes said that such occurrences must remind all commissioners that they were responsible to the ratepayers of the various municipalities for their actions, and that they must

give a "satisfactory account of their stewardship in order to retain their position." On the other hand, there were those who were promoted to higher office, such as Gordon H. Fuller, who, while President of District 8, had been elected President of the Ontario Municipal Electric Association.

Lauding the O.M.E.A. as a "sounding-board" or "court of appeal" to which any municipality could take its problems, Mr. Barnes urged that the rights of the municipality be maintained and kept at the level closest to the people.

"There is one way to maintain that unity of purpose," he continued, "and that is to attend other district meetings. By keeping in touch with each other, and learning our mutual problems, the O.M.E.A. will have an opportunity to remain strong and better able to serve the municipalities it represents. I believe that sullen obedience without protest is not desirable, but happy co-operation is the essence of good management."

### **Praises Commission**

Mr. Barnes commended Ontario Hydro on the occasion of its 50th anniversary. As one of the largest organizations in Ontario, the Commission enjoyed good relations with



# RE



WITH the aid of this illuminated wall diagram, Gordon M. McHenry, Consumer Service Engineer, Western Region, explained the function of the E. V. Buchanan Transformer Station near London in transmitting power to Hydro customers in southwestern Ontario.



△ CHARLES Phelps, Sarnia, Secretary-Treasurer, District 8 O.M.E.A., presented the annual report of the association. President John T. Barnes (on the right) gave the inaugural address.



the municipalities, maintained, principally, by keeping the interests of the municipalities on the same level as its own. Thus, it wisely avoided the pitfalls of becoming a pawn of a political football.

Secretary-Treasurer Charles S. Phelps presented a financial report showing a balance on hand of more than \$2,000. In congratulating the local association on this record. Lt.-Col. A. A. Kennedy, Ontario Hydro Commissioner, drew attention to the fact that the Georgian Bay M.E.A., also financially sound, had agreed to use some of its surplus funds to establish a scholarship in electrical engineering.

### Resolutions Endorsed

Several resolutions were actively discussed, and carried unanimously. It was agreed that the expenses of any official representative of the association, travelling outside the district, would be paid by the district organization and not by the official's local municipality, unless such expenses were paid by the parent association.

*(Continued on Page 24)*

TWO Oil Springs delegates, John T. Webb and K. G. Cowell, exchange greetings with Reeve George Hayes, St. Clair Beach (right).



Windsor Utilities Commission submitted a resolution pointing out that provincial regulations would not allow issuance of permits to a local, privately-operated gas company for the use of natural gas for space heating "unless there is a year-round load such as a water heater or range in addition to the space-heating equipment." "This practice," the Windsor resolution contended, "has resulted in a great many householders being forced to dispense with electric water-heating equipment, with which they had been quite satisfied." This form of conditional agreement was in violation of "ethical business practices." The delegates approved a resolution asking the O.M.E.A. to appoint a special committee to study this situation, and to suggest ways and means of correcting it.

The Sinking Fund came in for lengthy discussion, resulting in the following resolution: "That the O.M.E.A. take the necessary steps to open negotiations with Ontario Hydro on the disposition of the Sinking Fund in cases where rural distribution systems have been transferred to municipalities."

Hon. Bryan L. Cathcart, Ontario Minister of Travel and Publicity, was luncheon guest speaker, paying tribute to municipal Hydro commissions throughout the province for the contributions they had made and were making to the progress of Ontario.

Lt.-Col. Kennedy brought greetings from Ontario Hydro, while T. J. Moffat spoke briefly on behalf of the Grand Valley Municipal Electric Association (District No. 6). Bert Merson, Toronto, who gave a review of the activities of the Municipal Hydro-Electric Pension and Insurance Plan during the business session, brought similar greetings from District 4 as President.

A highlight of the luncheon was the description of an illuminated wall diagram provided by Gordon



HON. Bryan Cathcart, Ontario's Minister of Travel and Publicity, paid tribute to municipal Hydro Commissions throughout Ontario.

McHenry, Consumer Service Engineer, Western Region. The panel showed the function of the E. V. Buchanan Transformer Station at London in receiving and controlling the flow of power from the Ottawa and Niagara Rivers and other sources to distribution points in southwestern Ontario.

Other speakers were R. M. Laurie, Manager, Western Region, Ontario Hydro, and Harry Foy, Manager of the Electric Service League of Ontario, who discussed "A Way to Better Service."

#### A.M.E.U. Report

A report on the progress of the A.M.E.U. was presented at the afternoon session by President E. A.



POINT Edward's Reeve J. M. Lea (left) welcomes Mayor W. C. Nelson, Sarnia.

Washburn. The speaker stated that there were some 200 A.M.E.U. members, working on almost 60 association committees, assisted by nearly 50 Ontario Hydro staff members. Before the end of 1956, these committees will have participated in 120 meetings, Mr. Washburn stated, in commending the assistance of Ontario Hydro representatives.

Mr. Washburn outlined several objectives for the present year, including assistance in reorganizing the Accounting and Office Administration Committee, and providing more support at the conferences sponsored by this committee; the establishment of a Municipal Finance Committee in 1957; broadening of the A.M.E.U. financial picture in order to carry out new projects.

"This year we formed an A.M.E.U. organization in the Western Region. This new regional organization will be of great assistance to the members of municipal staffs, who do not have an opportunity to attend either the summer technical conference or the winter convention," the A.M.E.U. President continued. In this connection he reported that two provisional executives had been established with Clayton Leach, Chatham, and Basil W. Grover, London (now deceased), as chairmen.

Concluding the convention, delegates endorsed a resolution to reelect the 1956 officers for another term. President J. T. Barnes, Sarnia, will be assisted by the following executive: Past President S. G. Thomson, Chatham; 1st Vice-President—Roy C. Warwick, Blenheim; 2nd Vice-President—Thos. A. Cada, St. Clair Beach; Directors—M. J. Brian, Windsor; Thos. C. Odette, Tilbury, and Lawrence Graham, Leamington. C. S. Phelps, Sarnia, was reappointed Secretary-Treasurer. Dr. Richard L. Hearn was named Honorary President, while Gordon H. Fuller was elected Honorary Vice-President. Tilbury was selected as the meeting place for the 1957 convention. — *by Horace Brown.*





PRESENTATION of a television set and hobby-saw expressed civic esteem for A. E. Ditchburn, retiring Strathroy P.U.C. Manager. Among the chief figures at the complimentary dinner were (left to right): Mayor Ronald Dolphin, Commissioner W. C. Pearson, Chairman A. C. Anderson, Mr. and Mrs. Ditchburn, and their daughter, Mrs. Evelyn Parker. Mrs. Ditchburn was presented with a bouquet during the banquet attended by civic and Hydro representatives.

# Public Acclaim

## HONOR A. E. DITCHBURN AT COMPLIMENTARY DINNER

EXPRESSING esteem for a respected public servant, six former mayors and the present Mayor of Strathroy were on hand to fête A. E. Ditchburn when he officially retired as Manager of Strathroy Public Utilities Commission recently.

Recognition of Mr. Ditchburn's outstanding service to Strathroy was embodied in a complimentary dinner at Cobblestone Inn, near London, on November 1, when members and staff of Strathroy P.U.C., as well as civic and Ontario Hydro associates gathered to honor the retiring utility executive.

Many tributes were paid to Mr. Ditchburn, including one from Mayor Ronald Dolphin, who recalled that Mr. Ditchburn had guided utility operations in Strathroy for 24 years. "He has served under nine mayors, seven of whom are still living, and a man who can stand nine mayors is a man of whom we can feel very proud," Mayor Dolphin commented amid laughter.

Also in a reminiscent vein, Commissioner Winston C. Pearson referred to the division of opinion respecting utility affairs that existed when Mr. Ditchburn came to

Strathroy. "By his impartiality and fairness to all, he helped to smother the flames of strife until, today, we have difficulty in remembering the issues and the various factions of those early days."

Mr. Pearson also recalled the depressed conditions in 1932 when Mr. Ditchburn assumed the reins of managership. Since that time, the number of customers had increased, power consumption had trebled and water consumption had increased almost to the same extent. At the same time, lines, watermains, pumping stations and substations had been greatly improved, more wells had been added and a new substation (to be called the Ditchburn substation) had been constructed. In addition, frequency standardization operations had been completed. Due to careful financing, Strathroy P.U.C. was now almost free of debt.

"All this, and the fact that our rates are almost the lowest of any town of comparable size indicate excellent management," Mr. Pearson declared.

Remarking that the retiring manager had been a good citizen, Mr. Pearson pointed out that Mr. Ditchburn had been a willing and active member of his church, serving on the board of management, as well as on the local parks board, recreation committee and industrial commission. In addition, the value of his work with the Lions Club had been symbolized in the award of the first life membership in Lions International.

On behalf of the Strathroy Commission, Mr. Pearson presented a television set to Mr. and Mrs. Ditchburn.

Reginald Tufford and Gordon Zavitz presented a hobby-saw on behalf of the staff, while Mrs. Ditchburn was the recipient of a bouquet of red roses, presented by Miss Marilyn Leitch.

R. M. McKenzie, former Manager, West Central Region, Ontario

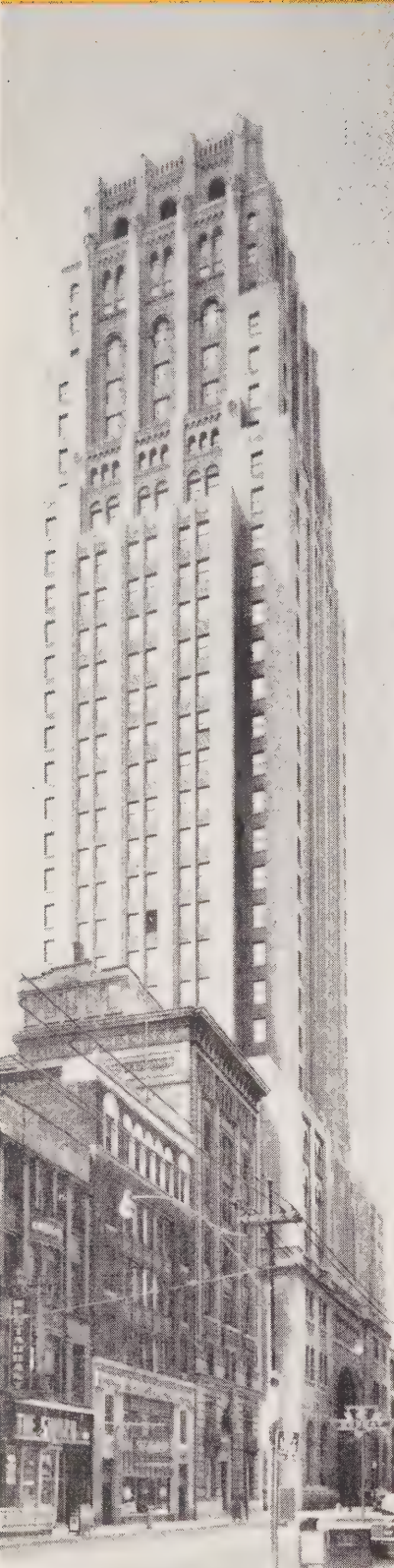
(Continued on Page 31)

## RAISE FREQUENCY IN TORONTO'S TALLEST BUILDING

# A STORY OF STOREYS

Changeover crews complete operations at

Canadian Bank of Commerce Head Office



**R**OBERT Dunn was a worried man. Superintendent of Toronto's 34-storey Canadian Bank of Commerce building, the tallest structure of its type in the British Commonwealth, he was not anticipating the start of frequency standardization operations with marked pleasure.

The superintendent of a building that soars 457 feet above street level, with four floors below ground surface, has many responsibilities. Resembling a small town, with a daytime population of some 3,000 people and its own lighting (auxiliary), heating, mailing and fire protection systems, as well as unique elevator facilities, the bank's Head Office on King Street presented a new challenge to Ontario Hydro standardization crews.

Thus Mr. Dunn's worries as the

dread changeover day arrived were, perhaps, understandable.

A group of trained technicians marched into the building at 7 a.m. and got the big project off to a flying start by commencing work an hour earlier than usual.

These men knew exactly where to go and what to do as 25-cycle ballasts were whisked out of hundreds of fluorescent lights and replaced with 60-cycle equipment. At the end of the first day, the 25-cycle flicker had vanished and so had Mr. Dunn's worries.

"When I saw for myself how efficiently everything was organized," he said "and how apparently complex tasks were dealt with as routine operations by Ontario Hydro and its contractors, I knew there was simply nothing to worry about, and I went home and ate my dinner with renewed appetite."

Conversion of the bulk of the commercial equipment in the building was completed in two days, including many special items such as

**CHANGING** the power supply of Toronto's Canadian Bank of Commerce building to 60 cycles required the alteration of more than 1,700 pieces of electrical equipment.



electric typewriters, calculating machines, a xerography machine, etc.

### Elevator Changeover

Changeover of the 15 elevators serving the building was necessarily a much slower process. These, in accordance with Ontario Hydro's policy, were standardized by the manufacturers. They were taken out of service in sections of three, leaving 12 in operation at all times. But several months' work was necessary before all 15 were operating at 60 cycles. Commenting on this phase of the project, Mr. Dunn states that, at 60 cycles, the elevators are now comparable to a new system, as changes, coincident with standardization, will reduce "outage time" for maintenance.

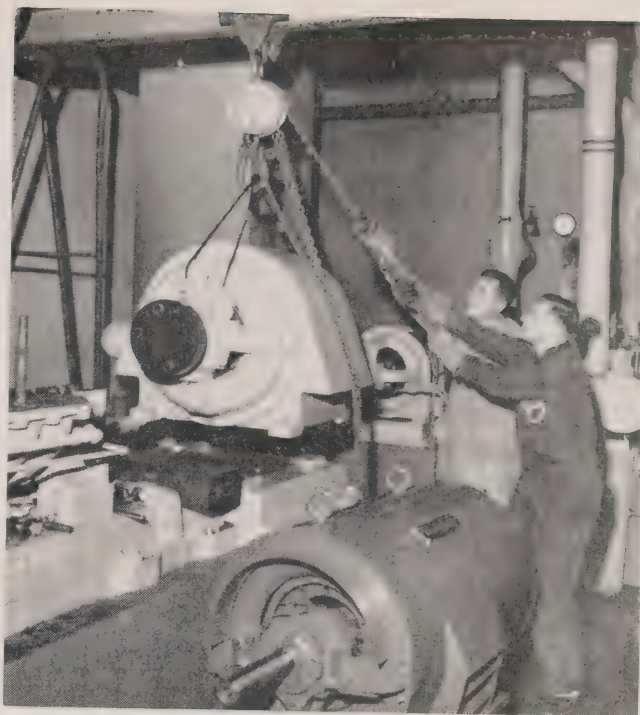
Other outstanding items of equipment affected were the vacuum tubes by which letters and other documents are transmitted to any of the 34 floors in the mammoth building. This equipment, powered by a 60-horsepower motor, required fine and critical modification of fan blades.

Among the 1,761 items altered, were two motors of 200 and 250-horsepower capacity, which are used to pump water at high pressure to the 34th storey for fire protection and other purposes. These motors are among the biggest the Commission has had to convert in any commercial building.

Coinciding with frequency standardization work, a change in the voltage from 550 to 208 volts was effected by the Toronto Hydro-Electric System.

Building Superintendent Dunn's comment provides an apt summing up of this special assignment:

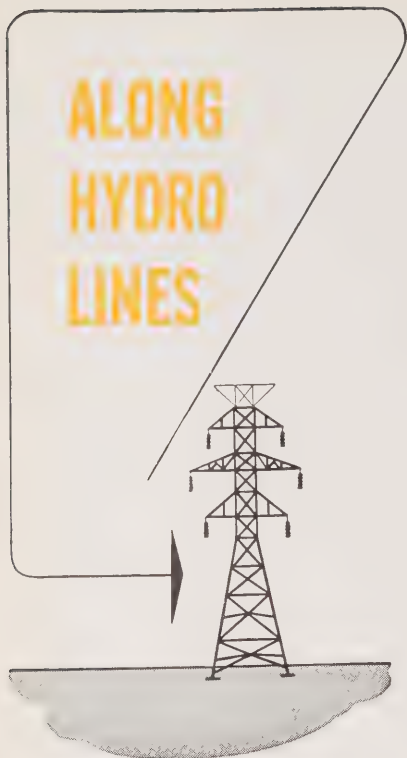
"This efficient changeover of frequency and voltage of the building is an outstanding example of the way highly complex operations can be smoothly completed through the cooperation of all the parties concerned." — *by Frank C. Wood.*



FREQUENCY standardization technicians are removing a 200-horsepower motor, which operated a high-pressure pump for fire protection and other purposes. The 60-cycle replacement unit is ready for installation. △



THIS large control panel in the basement of the 34-storey building illustrates the size of the bank's extensive electrical system. △



#### **Honor Windsor Utility Employees**

Members of the Quarter-Century Club of Windsor Utilities Commission have accumulated a total of more than 3000 years' service in the utility's Hydro and water divisions.

Two new members were admitted to the ranks of the club at a recent dinner sponsored in honor of the club, which now boasts a membership of 92. John F. Cook, Office Manager, and Miss Christine Hunter received special presentations as tokens of their 25 years' service.

On behalf of the National Safety Council, Roy Beith, Manager and Secretary-Treasurer, Electrical Employers' Association, Toronto, presented the president's medal to Laurence Renaud, W.U.C. lineman. Mr. Renaud was credited with saving the life of James Duncan, who accidentally touched a 4,800-volt conductor in the transformer room of Windsor's Grace Hospital last April. Mr. Renaud removed the injured man from the line and restored normal breathing by artificial respiration.

## **Customers Moving Set Up a Chain Reaction**

*(St. Catharines Standard)*

**S**T. CATHARINES people like to move — not far but often.

Well over half the families in St. Catharines move once a year, according to public utilities statistics. The average is 40 each working day.

Out of the city's 12,000 domestic electrical customers, 10,000 move each year. And each customer represents a family averaging slightly more than three persons.

Moving is a chain reaction, explained Manager Ray Pfaff of the P.U.C. As one family moves out, another moves in, leaving another apartment or home vacant. Sometimes the chain of moves involves seven or eight families.

If St. Catharines folk would just stay put, the P.U.C. could cut down its staff by at least one man and two office girls, said Mr. Pfaff ruefully. Each time someone moves, a P.U.C. employee must visit the residence, read the meter, and seal the power off.

And the next week he usually has to go back and restore power for the new family, he added.

The constant coming and going keeps two girls working steadily preparing "broken" bills, explained Mr. Pfaff. All billing is done on a regular, crowded schedule, so any part

bills have to be handled separately and manually.

One day is the average amount of warning people give to the P.U.C. about their intended moves. And regular meter readers can't retrace their steps to look at meters already passed by. The readers work on a strict schedule, he stated. Some people wonder why a reader can't be sent out the moment they 'phone in.

Broken bills are mailed to a former customer's new address after allowance has been made for the deposit left when the customer first moved in. But many people, who move out of the city, leave without warning and without giving a forwarding address. Consequently the P.U.C. has many part deposits still credited to former consumers, who may never claim them. But they must be kept on the P.U.C.'s books.

Weekend and holiday moving when no one is on duty at the P.U.C. is a problem, Mr. Pfaff said. Usually the meter is read on Friday or Monday, but in an emergency — people moving in from out-of-town need power — a trouble man takes care of it.

People could assist by giving a week's warning before moving so the meter reader could fit the residence into his schedule on the correct day, emphasized Mr. Pfaff. ■

#### **Open New C.S.A. Winnipeg Office**

A new district office of the Canadian Standards Association has been opened in Winnipeg, and Michael Lasko, P. Eng., has been appointed district engineer. Mr. Lasko will also be in charge of the new C.S.A. testing station at the University of Manitoba, which is being established for the use of electrical equipment manufacturers in the three prairie provinces.

#### **Brampton Undertakes Improvement Program**

Street lighting improvements and construction of a new outdoor-type municipal substation are features of a \$170,000 program of extensions and improvements to the electrical distribution system of the Brampton Hydro-Electric Commission, Chairman Wilfrid J. Abell has announced. Several of these projects are now under way.



### Windsor Honors Long-Service Members

Three employees of Windsor Utilities Commission, with service totaling 101 years, were honored by commissioners and colleagues at a recent ceremony.

Alex Shaw, Chief Engineer, who retired in October, after completing 36 years' service; Miss Grace Elliott, domestic billing supervisor, and Miss Christine Hunter, of the accounting department, were presented with gifts in recognition of their lengthy service. Participating in the presentation ceremony were Chairman M. J. Brian, Commissioner Gordon H. Fuller and other utility representatives.

Mr. Shaw commenced his service in 1920, becoming Chief Engineer in 1950 following the death of D. E. Charters. A graduate of Queen's University, Kingston, Mr. Shaw served with the Canadian army before joining the Windsor staff.

Miss Elliott, on the staff of the domestic billing department since 1916, was the second woman employed by the utility. She became supervisor shortly after joining the department. Miss Hunter has been a member of the accounting department since she began work in 1931.



### METERMEN NAME OFFICERS

**L. J. PASSMORE**, Delhi, was elected President of the Grant Valley Metermen's Association, during the fall meeting at Acton recently. Featuring the program were papers on "Induction Type Watthour Meters" by J. G. Steiss, Waterloo P.U.C., and the "Application of Instrument Transformers" by R. J. Martin, Packard Electric Company, and a film presentation on "Atomic Energy" by the courtesy of the Canadian General Electric Company. New officers of the association are shown in the photograph above: (first row, left to right) — D. M. Smith, Secretary, Delhi; President L. J. Passmore, and A. G. Stacey, Guelph. (Second row, left to right) — Otto Reiber, Waterloo; J. G. Steiss, Kitchener, and W. D. Stalker, Simcoe.



### WOODSTOCK MEETING

**E**VOKING spirited discussion during the fall meeting of the Western Ontario Electric Meter Association at Woodstock was a "question-and-answer" period led by a panel composed of: Chairman D. Bruce, Toronto; T. H. Lewis, W. R. Percival, and N. J. Lake, all of Ontario Hydro, and J. G. Steiss, Kitchener. Mr. Steiss, who is Meter Superintendent of Kitchener P.U.C. also presented his paper on "Induction Type Watthour Meters," which has featured several district meter group meetings in recent weeks. "Safety in Metering" was discussed in a paper by Roy Beith, Manager and Secretary-Treasurer, Electrical Employers' Association, Toronto. A display of new types of metering equipment, set up by the Woodstock P. U. C. staff, created keen interest among those attending the one-day session. Shown in the photograph above, (left to right) are: J. G. Steiss, C. W. Arend, Windsor, President; Roy Beith, and R. Demerling, Windsor, Past President.

### Buy Christmas Seals



### Help Fight TB



### **Basil W. Grover Dies at London**

Basil W. Grover, Assistant General Manager, London P.U.C., died suddenly on November 7 after a few hours' illness.

Born in England 45 years ago, he came to Canada as a boy. The deceased was educated at London and graduated as an engineer. He joined the London P.U.C. staff in 1927, and eventually became Manager of the Lighting Service Department. In 1939 he went on active service, arriving in England with the first contingent to leave Canada. Subsequently he held the rank of lieutenant-colonel being in command of Division Signals before leaving for Italy. He served in Italy and western Europe until the cessation of hostilities. His distinguished military record earned him O.B.E. and E.D. awards, as well as Mention in Dispatches. In 1953 he relinquished his command of the 9th Signal Regiment (Reserve) at London. On demobilization, Mr. Grover became General Superintendent, London P.U.C., and in 1952 was made Assistant General Manager. A member of the A.M.E.U., he recently was elected to the chairmanship of a provisional executive for the recently-formed Western Region of the association.

### **North Bay Completes Lighting Program**

North Bay has become a brighter city with the completion of a \$45,000 street lighting program.

Started during the spring months of the present year, the project provides for the installation of some 1,000 lamps, including approximately 180 mercury vapor lamps, as well as 150 incandescent types of 500-watt capacity and 670 of 200-watt capacity.

Announcing that the program was ahead of schedule, B. M. Graham, Manager, North Bay Hydro Commission, said recently that it would triple the average illumination level on city streets.



### **"FASCINATING" MODELS**

**"REALLY** fascinating" was the term used by the Hon. Livingston T. Merchant, United States Ambassador to Canada, to describe Ontario Hydro's hydraulic scale models during a recent visit to the A. W. Manby Service Centre. The Ambassador is shown in the foreground with the Commission's Chief Engineer, Dr. Otto Holden (right), admiring the detail reproduced in the Niagara model. Others in the photograph, from the left, are: W. Ross Strike, First Vice-Chairman, Mrs. Merchant and Mrs. Holden. United States Consul-General C. W. Gray and Mrs. Gray accompanied the Ambassador and Mrs. Merchant.

### **St. Thomas P.U.C. Dean Retires**

Regarded as the dean of the St. Thomas P.U.C. staff, Sydney L. Chamberlain retired on October 30 with 44 years' service to his credit. Born in Surrey, England, he came to Canada in 1910. When the First World War broke out, he joined the 1st Canadian battalion on August 10, 1914 and was among

the first contingent to leave Valcartier Camp for Great Britain the same year.

Invalided home in 1917 he founded the Returned Soldiers' Association that year. This organization has, in later years, become affiliated with the Canadian Legion and Mr. Chamberlain has played an active role in the activities of the St. Thomas branch.



## WESTON HONORS HYDRO

*(Continued from Page 19)*

covers, were sold in many countries of the world, he added.

Mr. Richardson also paid tribute to Weston citizens, who had made important contributions to the development of the municipality. The veteran utility officer made specific mention of Dr. W. J. Charlton, Reeve in 1899, who was primarily responsible for the introduction of electrical service. The speaker also commended the long-time Superintendent of Weston P.U.C., Allan Peirson, who guided the utility during its formative years.

Climaxing the program, the audience applauded the presentation of two films provided by the Canadian General Electric Company and Ontario Hydro, depicting developments on the St. Lawrence and Ottawa Rivers. Guests of the Weston Commission also took a keen interest in the Commission's scale model of the St. Lawrence Power Project, which was on display in the school cafeteria. Here refreshments were served to bring this Hydro Golden Jubilee salute to a successful conclusion. ■

## POLE ASSAULT

*(Continued from Page 21)*

"shorting" power lines when they paused to rest on crossarms. The company's development engineers eventually came up with a cure. A mechanism, tripped by the bird's weight, smites the buzzard either fore or aft, depending on which way he's sitting, and sends him off, flapping and squawking.

Frogs and snakes are the gangsters in some tropical countries. Haitian construction men, checking a power loss, reported locating a family of frogs in an antenna housing.

Snakes aren't a menace to Hydro operations in Ontario however, likely because the Canadian variety of serpents aren't given to climbing poles. In fact one enterprising Hydro maintenance supervisor near Timmins

probably thinks it wouldn't be a bad idea if somebody offered a course in pole-climbing to Ontario snakes.

Beset by pileated woodpeckers and hard put to keep them from drilling in the poles along one semi-isolated section of line, he sat down to ponder the problem. Having at hand a large container of green paint and a 20-foot length of rope he thoughtfully dunked the rope in the paint and set it out to dry.

By the time he had wound the rope carelessly down the length of one pole there wasn't a woodpecker in sight. Nor, he says, did they come back. Woodpeckers, it seems, don't care for snakes, even the imitation variety. ■

## PUBLIC ACCLAIM

*(Continued from Page 25)*

Hydro, said Mr. Ditchburn had striven to improve electrical service in Strathroy, and had complemented a fine technical background with character, human interest and a sense of fairness.

### Civic Achievement

Ex-Mayor James Kirby, recalling that he had been instrumental in bringing Mr. Ditchburn to Strathroy said this fact represented a civic achievement of which he was extremely proud.

Representing Manager R. M. Laurie, Gordon McHenry, Consumer Service Engineer, Western Region, drew attention to the fact that this was Ontario Hydro's Golden Jubilee year, and that the people of the province were very proud of the electrical developments, which had taken place during the last 50 years. "Mr. Ditchburn," he said "can take particular pride, because he has been personally concerned with a large number of these developments."

In expressing thanks for the gifts and good wishes, Mr. Ditchburn paid tribute to the loyalty and co-operation of the staff.

Commending the line crew, particularly to his successor David Rolston, he pointed out that they were men of unusual ability and with versatile talents. "In times of trouble," he said "they did not wait to be called out, but came out voluntarily."

He voiced appreciation of the co-operation he had received from members of the local commission over the years.

Briefly discussing his career, which started with the Niagara Falls Power Company at Niagara Falls, N.Y. in 1902, Mr. Ditchburn referred to the hazards facing those in the electrical industry in earlier years.

"Young engineers of today," he said "are happily ignorant of these hazards. In those days there was no safety first training, despite the fact that some of the equipment with which operators and others had to deal was extremely dangerous, and the prevailing conditions at that time resulted in an extensive loss of life." —by Frank C. Wood.

### Leamington Honors Retiring Superintendent

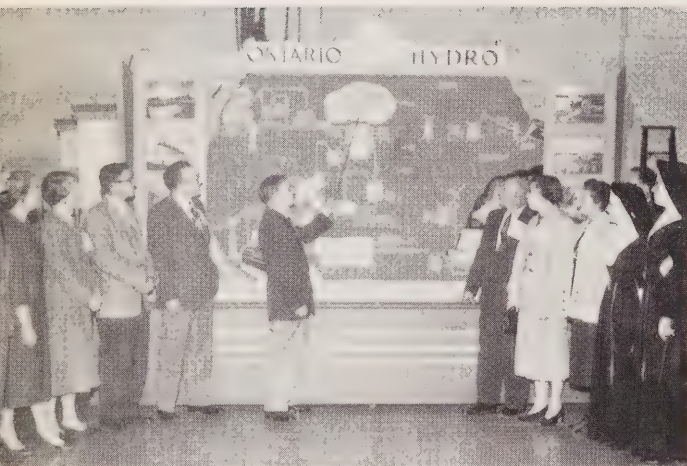
Harry Dawe, Superintendent, Leamington Public Utilities Commission, was honored at a banquet and presentation at the Leamington Golf and Country Club recently to mark his retirement.

Joining the Leamington utility in 1924, after service with the Detroit Edison Company, Mr. Dawe was recognized for his capable leadership in overhead line construction.

On behalf of the commission, staff and several personal friends, Commissioner Lawrence Graham presented a chair to Mr. Dawe. A gift package was also presented on behalf of the H. J. Heinz Company. Greetings were extended to the retiring superintendent by Town Clerk W. E. Selkirk, Elmer Sherman, Kingsville, and Jack Eltherington.



# FOTO-NEWS



**TEACHING THE TEACHERS** - Sarnia Hydro - Electric Commission was among the leading participants in the city's second annual Business-Education Day recently sponsored by the Sarnia Chamber of Commerce. Designed to acquaint teachers with the requirements of industry and present-day job opportunities, this year's program included visits to various industrial and retail establishments in the city. Sarnia Hydro played host to a group of 10 teachers, who visited local transformer stations where they heard explanations of the facilities and purpose of these installations, and witnessed a pole top resuscitation demonstration. They also toured the commission's Hydro Shop and offices to observe office routine and accounting procedures, and viewed the Hydro film "The Powerful Horseshoe," depicting the construction of Ontario Hydro's Sir Adam Beck-Niagara Generating Station No. 2. Enroute the guests were photographed as they listened to a description of the function of Hydro's E. V. Buchanan Transformer Station at London provided by Allan Lawson with the aid of an illuminated wall diagram. The group includes (left to right): H. A. Luckins, Secretary-Treasurer, and Paul Blundy, Vice-Chairman, Sarnia Hydro; Jean Woodward, Margaret Hayes, Lorne Wilkie, George Hosie, Mr. Lawson, John Needham, Ellen Jamieson, Jean Lawrence, Sister Theresa Marie and Sister M. Ignatia.

**HYDRO TROPHY** - F. C. Adsett, Consumer Service Engineer, East Central Region, presented the Ontario Hydro trophy at this year's International Plowing Match sponsored by the Ontario Plowmen's Association. Held near Brooklin, a few miles north of Oshawa, the Match was voted an outstanding success. The Commission was represented among the exhibitors with models of an electrified farm, the St. Lawrence Power Project, and a nuclear-electric generating station, while a new demonstration wiring panel also created considerable interest. Mr. Adsett is shown at the banquet marking the conclusion of the Match as he presented the Hydro prize (a fractional-horsepower motor) to Howard Nesbitt, Woodville (right). The trophy was awarded as first prize in Class 18 for tractor plowing, open to those who had not won a 1st or 2nd prize in the open tractor class and to boys under 21.



**OVER THE TOP** - Metropolitan Toronto's United Appeal fund received a substantial boost from Ontario Hydro management representatives and employees who contributed a total of almost \$80,000 this year.

The Hydro collections, which helped to put the appeal "over the top" for 1956, represented an average donation of approximately \$16 from some 5,000 staff and executive members of the Commission. Double last year's response to the Community Chest appeal, the contribution was placed aboard a Hydro truck by (left to right): Cecil Walker, then President, Employees' Association of Ontario Hydro; T. S. McFadyen, Co-Chairman of the Hydro campaign; Milan Nastich, President, Canadian Federation of Employee Engineers and Scientists (Ontario Hydro unit); F. R. Brebner, Ontario Hydro Treasurer, and A. M. Kennedy, representing the United Appeal organization.



# NINETEEN HUNDRED AND FIFTY-SEVEN

## JANUARY

S	M	T	W	T	F	S
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6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

## FEBRUARY

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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

## MARCH

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					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
<sup>24</sup> / <sub>31</sub>	25	26	27	28	29	30

## APRIL

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## MAY

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## JUNE

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## JULY

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## AUGUST

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## OCTOBER

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## DECEMBER

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## MEMORABLE MILESTONES

Aggressive policies were necessary in 1911 and subsequent years in selling electrical appliances to make Hydro "pay." London's Hydro-Electric Department (forerunner of the present London Public Utilities Commission) was one of the first municipal utilities to establish a Hydro shop and the enterprising sales staff never lost an opportunity of promoting the sale of electric stoves, washers and fans, even enlisting the aid of Santa Claus in their spirited campaign. The truck shown beside London's first Hydro shop at Dundas and Wellington Streets (site of the present utilities building) was a battery-powered vehicle, the first horseless truck operated by the electric department. The electric stove on parade was manufactured in London, and according to E. V. Buchanan, retired General Manager of London P.U.C., sold for \$65, including installation.





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1956

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# HYDRO GOLDEN JUBILEE

ONTARIO HYDRO NEWS SPECIAL ISSUE





This Special Issue of  
**ONTARIO HYDRO NEWS**  
Has Been Published to Mark  
The Golden Jubilee of  
Hydro in Ontario

*1906 — 50 Years of Progress — 1956*



# ONTARIO HYDRO

# *News*

PUBLISHED BY THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO - 620 UNIVERSITY AVENUE, TORONTO



## GOLDEN JUBILEE ISSUE

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### DEDICATION

This special edition of *Ontario Hydro News*, bearing the symbols of the Jubilee year on its front cover and the striking, back-cover impression of the Commission's Head Office, University Avenue, Toronto, is dedicated to a great host of ardent proponents, vigorous administrators and loyal staff members, who, by their scientific and technical skills, and by their unselfish devotion to tasks, both great and small, have, in the past half-century, welded this publicly-owned enterprise into one of the largest and most widely-known electrical utilities in the world.

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# SEARCH FOR

## PUBLIC OPINION, PRIVATE ENTERPRISE SPURRED FORMATION

ONTARIO HYDRO is the realization of a vision. It was not the vision of one man, but of a number of public-spirited citizens. At first they formed no cohesive group. Although they had one goal in mind — electrical service at the lowest possible cost to the people of the province — opinions were divided as to how that goal should be reached.

At the beginning of the century, electricity was still very much a new kind of power. Few people had any idea of the benefits it would bring. But the visionaries saw electricity as the force that would provide the necessary impetus for growth and development. While they were not confined to any definite locality, they played a prominent role in the manufacturing areas of Ontario where industrial progress was being hampered by the lack of a ready supply of coal or oil.

Accounts of the genesis of the Hydro movement recall that although coal was available in eastern and western Canada, transportation costs made the use of Canadian coal practically prohibitive in Ontario. Thus, the province was almost entirely dependent for its supply on the coal fields of Pennsylvania controlled, as one Ontario newspaper stated "by large and powerful corporations, who also practically own the highways over which this coal is transported. As a result, the people of this province must always be subject to any laws, which may be enacted respecting the export of coal or strikes that may occur in the mines. For example, during the last great coal strike in the

United States, both soft and hard coal increased in value . . . The fuel famine became so widespread that the City Council of Toronto found it necessary to vote the sum of \$50,000 of the people's money for the purpose of supplying coal at actual cost in small quantities to the working people of that city." Thus groups of Ontario citizens began to look with interest at the "white coal" of Niagara Falls where the energy of the roaring river was being harnessed by private electrical companies.

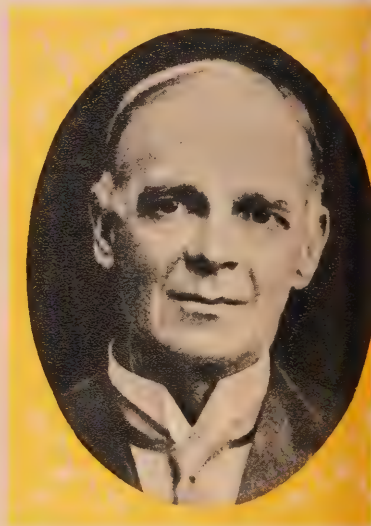
In Toronto, as early as 1900, the campaign for obtaining a supply of hydro-electric power began to gather momentum. The visionaries of the Queen City included men associated with leading commercial and industrial enterprises.

On February 19, 1900, the council of the Toronto Board of Trade appointed a committee to report on the question of power generally. This committee comprised W. E. Massey (Chairman), Elias Rogers, William Stone and A. E. Kemp, men who were described as having "left their mark on the commercial and industrial life of Toronto."

On April 25 that year, the committee reported that — "while electric power is not the all-important inducement in procuring new industries that is generally supposed, your committee believes that cheap electric power would be a great boon to our city, especially to small manufacturers and that reasonable measures should be taken to procure a power connection with one of



DANIEL B. DETWEILER  
"The Committee of One"



ALDERMAN F. S. SPENCE  
Toronto



# POWER

## OF ONTARIO HYDRO



companies operating at Niagara Falls... our hope for cheaper power is to bring the current from one of the great Niagara generating plants." The committee also raised the question as to "whether or not Toronto, as a city, should control his proposed Niagara connection." The Toronto Electric Light Company, however, was already negotiating to bring power from Niagara and the decision was delayed.

Mounting public opinion brought the Toronto City Council to grips with the problem again in 1902 and this time there was discussion with serious intent.

Already the need for a co-operative effort was becoming evident, and during 1902 meetings were held, attended by representatives of various towns and cities, boards of trade and manufacturers' associations.

### Detweiler and Snider

Meetings held at Waterloo and Berlin (now Kitchener) brought to prominence two men, who had been contemplating the possible benefits inherent in using hydro-electric power. These were Daniel B. Detweiler and E. W. B. Snider, a former member of the Ontario Legislature for North Waterloo. Snider was in business at St. Jacobs and Detweiler at Berlin.

Members of Mr. Detweiler's family recall that as far back as 186 he was discussing with friends, among them E. W. B. Snider, the idea of bringing electricity from Niagara to the communities of southwestern Ontario. Detweiler believed that the principles of pub-



IN 1893, the first diversion of water for power purposes on the Canadian side at Niagara Falls was used by the generating plant of the International Railway Company (left centre). This pioneer company operated an electric line between Queenston and Chippawa until 1932.



SCOTT STREET steam-electric station of the Toronto Electric Light Co. supplied electricity to the city for arc and incandescent lighting, as well as for industrial purposes, around 1900.

lic ownership could be successfully applied to the transmission and delivery of electricity from Niagara. He reasoned that Niagara would ensure a more ample supply of power than could be provided by local producers and he was convinced that public ownership of the transmission and distribution systems would mean a substantial reduction in costs. He succeeded in converting Snider and other friends to this point of view and a campaign was launched to gather support for the realization of their objective.

Mr. Snider addressed the annual banquet of the Waterloo Board of Trade on February 11, 1902. In his now famous speech, the St. Jacobs manufacturer advocated that "steps be taken to secure more industries of diversified character and also that a committee of men from Berlin, Waterloo, Guelph and Galt be formed to take up the question of bringing motive power from Niagara Falls into this district."

The response was not as favorable as Snider had expected, but Detweiler followed up his colleague's suggestion with a vigorous address to the Berlin Board of Trade in May, 1902, urging "the advisability of appointing a committee from different inland towns to take what steps they can to secure power from Niagara Falls."

### "Committee of One"

As the Board of Trade hesitated to take action, Detweiler asked that at least a committee be appointed to investigate the conditions under which manufacturing was being carried out in his own and adjacent municipalities. He was sure, he said, that evidence could be produced to

show that low-cost electric power was what was urgently needed. The meeting did not turn down this suggestion, but, as he could find no associates, Detweiler had to take on the job single-handed for, more or less in jest, he was named a "Committee of One."

Taking the appointment seriously, Detweiler rode his bicycle from place to place canvassing the municipalities in an itinerary, which extended from Berlin through



Guelph to Brantford, London and Stratford. Bringing back a notebook filled with observations and statistics, he enlisted the assistance of his friend, Snider, in preparing a report.

The report was read at a meeting in Berlin on June 9, 1902, which took the form of a banquet at the Walper House and was attended by manufacturers of mid-western Ontario and municipal representatives from Toronto, Galt, Guelph and a number of other surrounding towns. Mr. Snider was in the chair and Alderman F. S. Spence, Toronto, was the chief speaker. Another prominent figure at this meeting was C. H. Mitchell, engineer with the Ontario Power Company at Niagara Falls, who came at the invitation of D. B. Detweiler. Mr. Detweiler acted as secretary at this meeting. A subscription list to collect funds to "defray expenses incurred by the engineer's (Mr. Mitchell's) services and the cost of providing lunch for outside representatives" raised the sum of \$45 from 25 subscribers.

Mr. Spence suggested that the municipalities should ask for the appointment of a Government commission with authority to arrange for the transmission of electricity from Niagara to the municipalities desiring it. It was the first time that

a formal suggestion had been made that the responsibility for direct action should be removed from the municipalities and placed on the government. Mr. Mitchell expressed the belief that power could be delivered to the communities in the area at \$17 a horsepower per annum and urged immediate action as copper had gone down to 13 cents a pound.

In July of the same year, Snider, Detweiler and Spence were named a committee to obtain information on a co-operative plan for securing a supply of electric energy on the most favorable terms possible. Reports indicate that a meeting was held at Galt in October, 1902, where Mr. Snider reported on an interview he had with the Ontario Government. At this meeting, Snider and Detweiler, according to an early account, "were asked to proceed with their work in ascertaining how much power could be sold in the different municipalities and also to ascertain whether satisfactory arrangements could be made with any of the power companies then developing power."

Another significant event was Toronto's application to the Ontario Government in January, 1903, for the right to generate power at Niagara and transmit it for the use of that city. The petition was refused on the grounds that Toronto had no matured plan for exercising the powers requested.

Toronto, from that day, threw its lot with the municipalities of western Ontario.

### Historic Meeting

A month later the Berlin committee, was ready with its report which was presented at an historic meeting held in Berlin on February 17, 1903.

Representatives of the municipal councils of Berlin, Brantford, Dundas, Galt, Guelph, Hamilton, Hespeler, Ingersoll, London, Preston, St. Catharines, St. Marys, St. Thomas, Stratford, Toronto, Waterloo and Woodstock were on hand to hear this report. Delegates from boards of trade and manufacturing



associations brought the number to 57.

Power, the report stated, could be delivered from the generators of the Ontario Power Company at Niagara Falls for \$7 or \$8 a horsepower per annum. If it were transmitted to the interested municipalities "at cost," they would have to pay no more than \$14 or \$15 a horsepower.

Discussion of the report ultimately resolved itself into the following motion presented by Mayor Thomas Urquhart, Toronto: "That we respectfully suggest and urge upon the Government of Ontario the advisability of the government building and operating, as a government work, lines for the transmission of electricity from Niagara Falls to the towns and cities of Ontario, or that they extend the powers of the present Niagara Falls Park Commission so that they may, as a public work, build and operate the necessary lines to transmit electric energy from Niagara Falls, and that for this purpose they be empowered to issue debentures which might be guaranteed by the government, but which would be eventually paid out of the receipts from the sale of electric energy, thus entailing no charge upon the provincial funds, and that the municipalities here represented call on their representatives in the legislature to urge upon the government to carry out this resolution." Finally, with an amendment deleting all reference to the Niagara Parks Commission, the motion was put to the assembly and received its approval.

### Came to "Listen and Learn"

Following the proceedings at this meeting with eager attention was Mayor Adam Beck, London, who is also a member of the Ontario Legislature.

"I came just to listen and learn," he told Detweiler and Snider as the meeting adjourned. But, from that moment, all his dynamic powers of advocacy and transcending vision were enlisted in the movement to bring low-cost electric power to the people of Ontario and it was only a



E. W. B. SNIDER  
St. Jacobs



W. F. COCKSHUTT  
Brantford



P. W. ELLIS  
Toronto



PROF. R. A. FESSENDEN  
Washington D.C.



JOHN MILNE  
Hamilton



GEORGE PATTINSON  
Preston



short time before he became the recognized leader.

Events followed quickly.

Just ten days later, February 27, a committee waited upon the Ontario Government. The promise was made that the municipalities would be given the right to transmit power from Niagara and to co-operate for that purpose. Fulfilment of this promise came on June 12, 1903, when an Act was passed authorizing any two or more municipalities to appoint a commission to examine into and report upon the desirability of establishing works for the production of power, heat and light. Works decided upon were

to be carried out under a board of commissioners appointed by the Chief Justice of Ontario.

The Ontario Power Commission was formed at a meeting of representatives from seven interested municipalities: Brantford, Guelph, Ingersoll, London, Stratford, Toronto and Woodstock, held in Toronto on August 12, 1903. Its members were E. W. B. Snider, St. Jacobs, Chairman; Adam Beck, London; W. F. Cockshutt, Brantford, and P. W. Ellis, Toronto. J. C. Haight, Waterloo, a barrister, acted as Hon. Secretary, and John McKay, Toronto, financial adviser. Professor R. A. Fessenden, Washington, D.C., and Messrs. R. A. Ross and

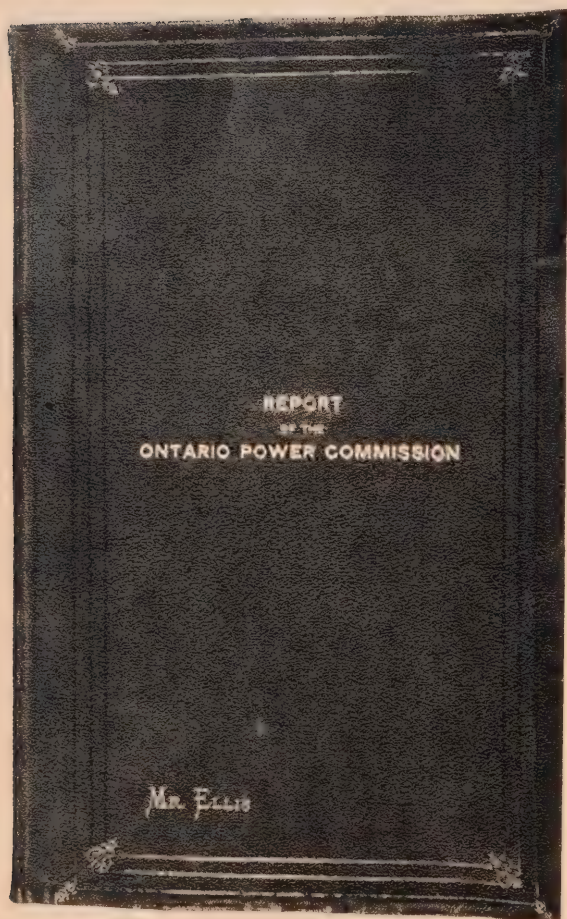
Henry Holgate, Montreal, all experienced engineers, were identified with the Commission as consultants.

This Commission prepared a 128-page report, published on March 28, 1906, and a fund for investigation was provided by municipal subscriptions amounting to \$16,000. In this report the availability and costs of power from primary sources of coal, gas, oil and water were set forth, and also data respecting the consumption and estimated future requirements of power in the districts concerned, the cost of developing Niagara power and other relevant matters.

While the investigations summarized in this report were still being carried out there was a change of government in Ontario. Re-elected for the London constituency, Adam Beck was taken into the cabinet formed by Sir James Pliny Whitney as a minister without portfolio. He, at once, stressed the difficulties encountered by a commission representing only a few municipalities in gathering material for a report that would give a clear picture of the general situation in the province. On July 5, 1905, at his recommendation, a Hydro-Electric Power Commission of Inquiry was incorporated by the Legislature. It was composed of Hon. Adam Beck, Chairman; George Pat-  
tinson, Preston (M.P.P., South Waterloo), and P. W. Ellis, Toronto. Mr. Ellis was forced to retire on account of ill health and John Milne, Hamilton, was appointed in his place.

### Five Reports Published

The first Government-sponsored commission made an exhaustive investigation into the waterpowers of Ontario. It published five reports dealing with : (1) Niagara district (2) Trent district; (3) Lake Huron and Georgian Bay district; (4) Ottawa Valley and St. Lawrence districts and (5) Algoma, Thunder Bay and Rainy River districts. Practically the entire province



FIRST Chairman of the Toronto Electric Commissioners, P. W. Ellis was a member of the Ontario Power Commission formed in August, 1903, which published this 128-page typed report in 1906.



except the extreme northern hinterlands was, therefore, included.

The reports were given wide publicity. They showed that the transmission of electricity from Niagara Falls to the municipalities of southwestern Ontario was practical and that, with respect to costs, it could best be carried out by a type of public ownership enterprise. Beyond that they indicated that conditions in many other areas of the province warranted the creation of such an organization.

In the spring of 1906, the burgeoning in woods and fields was to be symbolic as never before of the passing of "the winter of our discontent." On April 11, 1906, as the first green leaves shot out from the branches of maple, oak and elm, with promise of an expanding and revitalizing foliage, a delegation of some 1,500 representatives of Ontario municipalities — described in the contemporary press as "the largest that ever waited upon any government in Ontario"—streamed to the Ontario Government Buildings at Queen's Park, Toronto. They had come straight from a meeting at Toronto's City Hall where a resolution had been passed reading as follows:

"That the municipalities now present and represented in the City Hall, Toronto, having an urban and rural population of over 1,000,000, respectfully urge upon the Governor-in-Council of the Province of Ontario the necessity of safeguarding the people's interests by originating, as a government measure, legislation enabling the Governor-in-Council to appoint a permanent provincial Commission with power to take, where considered by it advisable, the following action: The construction, purchase or expropriation of works for the generation, transmission and distribution of electrical power and light; to arrange with any existing development company or companies for power at a reasonable price, so as to be transmitted and sold by the government to municipalities or others; also to vest in it



ARTIST'S conception of the Y.M.C.A. building (now used for commercial purposes) where a historic meeting was held at Berlin (now Kitchener) on February 17, 1903.

the powers necessary to enable it to regulate the price at which electricity shall be sold to all and every consumer, whether municipal, corporate or private."

At the Parliament Buildings the delegation was well received and the resolution duly presented.

To the Hon. Adam Beck fell the honor of introducing to the Ontario Legislature on May 7, 1906, the bill entitled "An Act to Provide for the Transmission of Electric Power to the Municipalities."

In substance the act was, to a large extent, his brainchild, but much of the legal phraseology was the work of the eminent jurist, Sir William Meredith, Chief Justice of Ontario at the time.

On May 9, the bill was given its second reading in the House and the third reading followed next day. Four days later, May 14, it was given Royal assent, and on June 7, 1906, the first Commission was formed to exercise its powers. Hon. Adam Beck was officially appointed Chairman, with Hon. J. S. Hendrie and Cecil B. Smith as Commissioners.

Thus was born The Hydro-Electric Power Commission of Ontario, now popularly known as "Ontario Hydro."



HON. ADAM BECK  
London



HON. JOHN S. HENDRIE  
Hamilton



CECIL B. SMITH  
Toronto

# KILOWATT ARMY



Hydro's complex network of high voltage transmission lines was built by "blood, sweat and tears" and a generous application of ingenuity and resourcefulness

**P**ACKING POWER in the most literal sense and spanning the length and breadth of Ontario, with spearheads reaching to the 52nd parallel of north latitude, a tireless army is on the move day and night. Recruited to a strength of 4,530,500 at the end of 1955, this is the army of kilowatts — kilowatts of electric power, lightening man's burdens and contributing perhaps more than any other factor to the material welfare and progress of the people of Ontario.

One has only to press a button or flip a switch and those kilowatts are there, marching with the speed of light along the conductors of thousands of miles of transmission line built and maintained by Ontario Hydro to link its sources of power with the municipalities, industries and rural areas of the province.

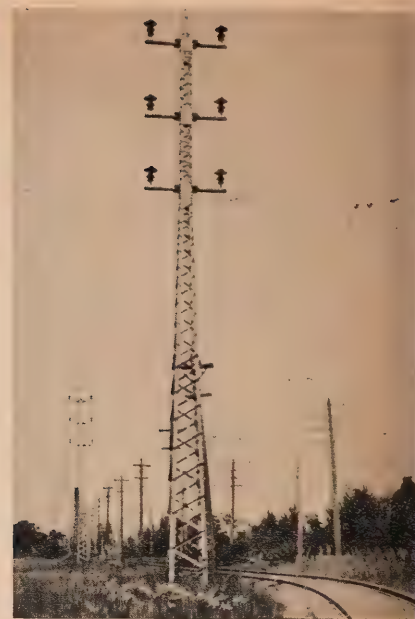
As early as 1907 — just one year after the creation of the Commission — location surveys were begun for the transmission lines that were to convey power purchased from the Ontario Power Company at Niagara to the first group of contracting municipalities in south-

western Ontario. In charge of one of these surveys was Thomas H. Hogg, later to be honored by a Doctorate in Engineering and to become Chairman and Chief Engineer of Ontario Hydro. Another party was headed by the late A. V. Trimble, who subsequently organized the Construction Department of the Commission.

The decision to purchase 25-cycle power from the Ontario Power Company at Niagara Falls represented the only course open to the Commission if it was to fulfill the popular concept — so long advocated by Detweiler, Snider, Beck and others — of supplying low-cost Niagara power to the municipalities of the province.

The Ontario Power Company, at that time, was one of three companies operating 25-cycle plants on the Canadian side of the Niagara River. These 25-cycle stations represented the only reliable major source of hydro-electric power available to the Commission in the years immediately following its formation.

The 25-cycle frequency was adopted in the Niagara area before



△  
PIN-TYPE insulators were used on this 60,000-volt line built by private power interests between Niagara Falls and Toronto.

the turn of the present century (after prolonged consideration and discussions on the subject) as a power frequency best suited to the new polyphase induction motor, the new rotary-converter and for long-distance transmission. In 1893, the Cataract Construction Company in undertaking the first hydro-electric project (now known as the Adams plant) at Niagara Falls, N.Y., for the Niagara Falls Power Company, had engaged a group of internationally-famous consulting engineers, including Dr. Coleman Sellers, Professor Henry A. Rowland of John Hopkins University at Baltimore and Professor George Forbes of England.

Professor Forbes, after considerable research, recommended a frequency of 16-2/3 cycles. In September, 1893, the Westinghouse Electric and Manufacturing Company submitted a proposal for 33-1/3 cycles. The latter company had already selected 60 cycles for lighting purposes and 30 cycles for larger power installations but proposed 33-1/3 cycles in bidding on the 5,000-horsepower, 250-rpm generators at Niagara.





△ VIEW of Dundas Transformer Station and construction of Hydro's first 10,000-volt transmission line in 1910, using suspension-type insulators.



△ ANOTHER "first" for Hydro engineers was a standard "wishbone" type of construction, which effected important economies in the building of this transmission line from Cameron Falls Generating Station in 1920.

The Cataract Construction Company declined to award a contract when the Westinghouse firm indicated that it was not prepared to guarantee satisfactory operation at any frequency less than 30 cycles. In October, 1893, following a winter conference in New York, the Cataract Construction Company, and Lewis B. Stillwell, the Westinghouse engineer in charge of the Niagara negotiations, reached a compromise by agreeing that 25 cycles would be an acceptable frequency.

### First Niagara Plants

Late in 1895 the first three 5,000-hp. 25-cycle Niagara units went into commercial operation, firmly establishing this frequency in the Niagara area. Early in the present century, the Niagara Falls Power Company built the Canadian Niagara Power plant on the Ontario side of the river at 25 cycles. The same frequency was selected when construction of two other Canadian plants at Niagara was undertaken by the Ontario Power Company in 1902 and the

Electrical Development Company (Toronto Power plant) in 1903.

The nearby city of Buffalo obviously presented a large potential market for 25-cycle power and this was another factor which probably influenced the final design of the generating units at the Niagara Falls' plants.

Thus Ontario Hydro "inherited" the 25-cycle frequency when it signed the first contract with the Ontario Power Company in 1907. This "legacy" was further perpetuated in 1915 when arrangements were completed for additional supplies from the Canadian Niagara and Toronto Power 25-cycle plants.

Signing of the contract with the Ontario Power Company constitutes an important chapter in Hydro annals. Apart from the fact that it created the nucleus of what was ultimately to become known as the Niagara Division of the Southern Ontario System, the contract marked the inauguration of 25-cycle power supply for a large section of Ontario. Its successful negotiation obviated the necessity of venturing into what, at that stage of the Commission's organization,

easily could have proved to be a costly experiment in power generation.

In 1914 when plans were formulated for construction of Hydro's major Queenston-Chippawa development (now the Sir Adam Beck-Niagara Generating Station No. 1) consideration was given to the question of designing it for 60-cycle operation. The long-distance transmission envisaged for this large development militated against the adoption of the higher frequency, however, and all units were designed for 25-cycle operation.

### Voltage Problem

In planning the long-distance transmission lines necessary to supply the original 14 municipalities, which signed contracts with the Commission in 1908, the small Hydro staff was confronted with the problem of voltage. In 1906 the Toronto and Niagara Power Company had built a steel tower line from Niagara Falls to Toronto — a distance of 75 miles — to operate at 60,000 volts, which was regarded as about the highest voltage that could be economically used.

In order to obtain more efficient transmission, Ontario Hydro decided to adopt a higher voltage and was one of the first utilities on the North American continent to transmit at 110,000 volts (now 115,000 volts), the first such line connecting Niagara and Dundas — a distance of 51 miles. In all, 566 circuit miles of transmission line were constructed to serve the participating municipalities, power being first officially turned on at Berlin (now Kitchener) on October 11, 1910.

Some difficulty was experienced with the original suspension insulators, which, at that time, were a comparative innovation, cracks developing in the porcelain after one or two years of service, due to temperature stress and changes in the cement and porcelain.

This gave rise to numerous interruptions and the consequent necessity of changing insulators. Subsequently the Megger system of testing insulators in place — with the line isolated — was adopted and this enabled defective units to be detected prior to failure. At the same time, studies made in co-operation with the manufacturers resulted in the production of more reliable porcelain insulators with improved cement joints between the insulators and hardware.

Conductor vibration and "galloping" were also sources of later trouble, which eventually resulted in improved tower design providing greater physical clearance between transmission conductors. The early aluminum stranded conductor was too light and of insufficient strength for the tensions and spans later used. This led to the adoption of an aluminum conductor with a high-strength, stranded steel core. Strand breakage developed from aeolian vibrations (vibrations caused by light winds) when transmission lines, with still higher tensions and longer spans, were designed and built in later years.

The investigation of these troubles and the adoption of satisfactory remedial measures were



FORERUNNERS of 1956 survey crews, this 1913 group, left to right: William Howland, Wally Goodall, Stanley Bolton, S. W. Johnston, D. J. Emery and P. W. Greene, was photographed near St. Thomas.

largely in the hands of men such as W. P. Dobson, H. J. Muehleman and A. E. Davidson (all of whom are now retired) and the late A. C. Goodwin.

The purchase of large blocks of power from Quebec to augment Ontario Hydro's resources required the erection of long transmission lines of high capacity. It was, therefore, decided to transmit at 220,000 volts (now 230,000 volts), which represented another pioneering effort. The first such line, between Pagan Falls on the Gatineau River in Quebec and the Leaside Transformer Station, was placed in service in 1928. This was followed by the construction of a 330-mile, 220,000-volt line from Beauharnois on the St. Lawrence River to Leaside which was placed in service in 1932. Since that time many 220,000-volt lines have been constructed to form the backbone of the Southern Ontario System, until today there are a total of 3,207 circuit miles of such line throughout the entire Hydro system, with power now being transmitted at 230,000 volts.

The construction and installation of transformer stations, like the building of transmission lines, called for a good deal of experimentation. A Station Electrical and Building Department was formed to look after this type of work, with the late E. T. J. Brandon in charge.

The operation of the entire system was, for many years, directed by Henry C. DonCarlos, who died in 1941. Ontario Hydro was one of the first power producers to introduce protective relaying in its system networks, to the designing of which E. Morley Wood and the late Dan MacKenzie were the chief contributors.

In the early years fires in substations were an ever-present hazard. In 1916, a conflagration almost wiped out the key Dundas T.S. The Commission's Chief Engineer (the late) F. A. Gaby, who was always on the scene when there was any threat to the security of system operations, drove over unpaved roads from Toronto to Dundas in record time. Under his direction, lines by-passing the mangled equipment were used to restore customer services a few hours after the fire was extinguished.

### First In Canada

Hydro's Leaside Transformer Station near Toronto (mentioned previously in this article) was the first 220,000-volt stepdown transformer station in Canada. Placed in initial operation in 1928, the station was regarded as one of the largest of its kind on the continent when completed. An innovation in the design of this station was the provision for placing certain facilities (previously considered to be





△  
TRANSMITTING power to almost every section of Ontario, the Hydro systems today include more than 16,100 circuit miles of transmission lines.



△  
DEVELOPED by Hydro engineers, this suspension block or "traveller" has facilitated the construction of transmission lines in recent years.

strictly indoor plant equipment) in outside locations.

Other significant features were the circuit breakers, which were believed to be the largest in physical size and to have the greatest rupturing capacity of any breakers manufactured at that time. The single-phase, three-winding, water-cooled transformers installed at the Leaside plant were also regarded as the largest in physical size of any manufactured up to that time in Canada.

### System Interconnection

In the early days of Ontario Hydro, the municipalities were grouped into systems utilizing common generation sources and transmission lines. As these first small systems expanded, interconnections were made with neighbouring units to form even larger systems. These linkages resulted in more economical use of all power resources available and an overall reduction in the cost of power. From such interconnections evolved the Niagara, Georgian Bay and Eastern Ontario Systems.

For many years, interchanges of power were made between the Niagara System and the Georgian Bay System through a frequency-changer station at Hanover. Then, in 1935, a frequency-changer set

installed in the Chats Falls Generating Station on the Ottawa River enabled interchanges to be made between the Niagara and the Eastern Ontario Systems. Such arrangements involved extra expenditure for each of the systems concerned, as each had to pay for the power received from the others through the interchange facilities.

In 1944 the three systems were amalgamated to form the Southern Ontario System.

Serving the territory extending in the northern part of the province from the Quebec boundary to the boundary of Manitoba are the facilities of the Northern Ontario Properties. Operated by the Commission since 1933, the N.O.P. comprises the Northeastern Division and the Northwestern Division, formerly the Patricia District. In 1952, the N.O.P. and the Thunder Bay System — one of the pioneer Hydro systems serving the Lakehead area — were merged for financial and administrative purposes and the consolidation continues to be known as the Northern Ontario Properties, which are largely held and operated in trust for the Province of Ontario.

Since 1950, transfers of power between the Southern Ontario System and the Northeastern Division have been possible through the facilities of the R. H.

Martindale Transformer Station at Sudbury. Larger interchanges have become possible since 1955 when the Commission re-insulated the 105-mile line connecting the Otto Holden G.S. and the R. H. Martindale T.S. for transmission at 230,000 volts instead of the former 115,000 volts.

Greater interchanges of power are envisaged for the future with the ultimate interconnection of the two divisions of the Northern Ontario Properties and the link already established with the Province of Manitoba.

### Hydro Aerial Surveys

In the expansion of the Commission's generating and transmission facilities the early acceptance of the method of aerial survey was an important factor of progress. In the mid-twenties aerial photos were first used in planning the location of the initial 220,000-volt transmission lines reaching from the Quebec boundary to Leaside, near Toronto. J. E. Sproule, now a consultant in the Engineering Division, was in charge of the field parties, which located the route by ground survey. The aerial method continues to be used where applicable, having been employed in connection with the routing of the transmission lines radiating from the Des Joachim's Generating Station





△  
STRINGING tie-lines across the Detroit and St. Clair Rivers for interconnection of the Ontario Hydro and Michigan's Detroit Edison Company systems in 1953 required close timing.



△  
HYDRO maintains a fleet of five helicopters, for aerial inspection of transmission lines—many in remote areas—effecting time and money savings in line patrol operations.

on the Ottawa River and for many other major lines.

With the rapid development, since World War II, of the science of photogrammetry, more advanced techniques of aerial survey have been employed by the Commission. Specialized photo interpretation has supplied valuable assistance in the search for aggregate deposits in the St. Lawrence area, in forestry problems related to right-of-way clearance through wooded areas (including trees endangering lines), in preliminary geological evaluation of dam sites, and in the re-establishment of original land surveys.

However, advanced techniques in aerial survey leading to the preparation of large-scale and accurate planimetric and topographical drawings, at a considerable saving in ground survey costs, have formed the larger contribution made by this new science to Hydro progress. Such plans have been employed for comparative evaluation of proposed hydraulic projects, in settlements for property rights, and for preliminary engineering design and estimating. The mapping of the St. Lawrence Project area, some 70,000 acres, is among the most extensive aerial survey projects of this type carried out in Canada. The resultant drawings served, and continue to serve, a multitude of purposes, including overall engineering design, community planning, and property evaluation and acquisition.

Another novel use of aircraft relating to the Commission's transmission facilities was the introduction of helicopter line patrol some years ago. When this service was inaugurated on June 15, 1949, the Commission became one of the first utilities in North America to use these aircraft for transmission line patrol work.

These "egg-beaters," as they are sometimes called, are equipped with modern two-way radio equipment for maintaining contact with the nearest mobile repair crew.

The use of these machines has proved a more efficient method of patrolling transmission lines than by ground patrol crews. It is estimated that helicopters have reduced line patrol costs by approximately 75 per cent, due to a substantial saving in time, the number of personnel required to perform this function, and the fact that it is no longer necessary to provide housing accommodation for ground patrol crews in remote areas.

Over the seven-year period, between June, 1949 and July 31, 1956, Ontario Hydro's five helicopters had patrolled 656,635 circuit miles of transmission lines and logged 13,231 flying hours. Today, approximately 10,300 circuit miles of line are inspected by the use of helicopter patrols.

There have been occasions when the Commission's helicopters have been called upon in emergencies. For example, when Hurricane Hazel struck southern Ontario in

1954, three Hydro machines flew a total of 134 hours and rescued at least 100 men, women and children. At the same time, Hydro's pilots assisted in recovering the bodies of 30 flood victims, and co-operated with the police in directing traffic.

The pioneering use of helicopters in line patrol operations emphasizes not only the ingenuity displayed by Hydro's engineers over the past half-century, but also the growing scope of the Commission's network of transmission lines and transformer stations throughout Ontario.

In 1910, Ontario Hydro had 566 circuit miles of transmission line and by 1920 that number had increased to 3,331. Today the Commission maintains over 16,100 circuit miles of transmission line and approximately 44,000 miles of rural distribution line. Together they supply electric energy directly and indirectly to more than 1½ million customers. The expansion of Hydro transformer station capacity is illustrated by the fact that in 1910, the Commission had only seven transformer stations with a total capacity of 17,250 kilovolt-amperes. In 1955 it made use of 104 transformer stations with a total capacity of 8,291,004 kva.

Times and methods may have changed over the past 50 years, but the men who build the paths along which Hydro's kilowatt army travels are just as ingenious as ever. ■



# VIRILE PARTNERSHIP

Ontario's co-operative Hydro enterprise now includes 343 associated municipal electrical utilities serving a vast segment of the province

*"All are architects of Fate,  
Working in these walls of Time;  
Some with massive deeds and  
great,  
Some with ornaments of rhyme."*

THESE LINES from Longfellow's poem, "The Builders," were written back in the last century. In this Golden Jubilee year, they might well be dedicated not only to the pioneers of Hydro but to the many who, over the years, have moulded it into a virile, co-operative partnership.

One might expand the application of this verse to include all those public-spirited citizens found in industry, in organized labor, in business life and the press who, by the written or spoken word, have helped first to awaken and then to maintain the confidence so necessary for the attainment of Hydro objectives. With the inspiration thus afforded, the "massive deeds and great" can be attributed to the support given by the Ontario Government and to the teamplay of Ontario Hydro and the Hydro municipal commissions and utilities.



VIEW of the Ontario Power Company plant at Niagara Falls in July, 1909. Hydro purchased power on contract from the company to supply the original 14 southern Ontario municipalities, which had signed agreements. This pioneer station was taken over by the Commission in 1917.

ING in the back seat of the open tour-  
car, left to right, Hon. A. J. Matheson,  
Provincial Treasurer; Mrs. Beck, Hon.  
Sam Beck, first Commission Chairman,  
and C. H. Mills (later M.P.P., Water-  
North), seated in front with the  
ever, were key figures in the  
triumphal parade preceding  
the formal inauguration of  
Hydro service at Berlin  
(now Kitchener) on  
October 11, 1910.







△  
LEADING the big Hydro parade at Berlin in 1910 were, left to right, Mayor C. C. Hahn (still a resident of Kitchener), Dr. H. G. Lackner (M.P.P. Waterloo North) and Ontario Prime Minister, Sir James Pliny Whitney.



△  
LONDON'S CITY HALL presented a gala front on November 30, 1910 when Hon. Adam Beck officiated at the Hydro ceremony.

Co-ordinating this co-operation and making it more effective and purposeful are two organizations known as the Ontario Municipal Electric Association (comprising elected or appointed representatives) and the Association of Municipal Electrical Utilities (of Ontario), which consists of management and senior operating staffs of the municipal systems. Both stem from the Niagara Electric Power Union, which was formed just after the turn of the century to champion the cause of a publicly-owned hydro-electric power system.

The Power Union continued to function for some time after the creation of Ontario Hydro; but when the Commission began to serve the original contracting municipalities with Niagara power, it was seen that its activities would have to be expanded to carry out this objective. Thus, the O.M.E.A. was formed in 1912. Its first President was G. R. Geary, at that time Mayor of Toronto, with E. M. Ashworth, who was to become General Manager of the Toronto Hydro-Electric System, as Secretary-Treasurer. The new organization became a liaison group, co-operating both with member municipalities and with Ontario Hydro.

Services rendered by the O.M.E.A.

have been invaluable to the people of Ontario. One of its earlier major achievements was to align the municipalities behind Hydro's first Niagara development — now the Sir Adam Beck-Niagara G.S. No. 1 — thus preventing a well-organized opposition from obstructing the carrying out of this important project. Throughout the years, this kind of support has been manifested continually and more recently was exemplified in the approval given by the municipalities to the frequency standardization program in southern Ontario.

Through discussion forums and meetings, the O.M.E.A. has been able to present a clear picture of the problems encountered by the municipal Hydro systems and to secure the co-operation of the parent Commission in their solution.

Working in close co-operation with the O.M.E.A. and Ontario Hydro is the A.M.E.U. This organization is a development from a special engineers' section formed by the Niagara Electric Power Union. From the beginning of the municipal system, it has been concerned with business management, and technical problems involving the supply of power and its distribution. The Commission works closely with the A.M.E.U. in establishing

municipal rate structures. In close contact with the Canadian Standards Association and the manufacturers, the A.M.E.U. is also in a position to advise on the practicability, safety and public demand with respect to new electrical equipment.

Until 1918, the A.M.E.U. continued to function, in effect, as the engineers' section of the O.M.E.A. Reorganization into a separate body, without any break in co-operation, was then carried out, and in 1919, the present name was adopted. The first president of the association was P. B. Yates, then Manager of the St. Catharines Public Utilities Commission. Continuing close relations with the O.M.E.A. were emphasized by the appointment of E.M. Ashworth as Secretary-Treasurer, who was serving the O.M.E.A. in a similar capacity.

### Beginning of Municipal Systems

All the activities carried out by the O.M.E.A. and the A.M.E.U. during the years serve to emphasize the fact that Ontario Hydro was created in response to a public demand, which was, at first, particularly voluble in the municipalities within feasible transmission distance of Niagara Falls. There were





△ IN DECEMBER, 1910 Ontario Hydro first supplied Port Arthur with power purchased from the Kaministiquia Power Company.

14 to start with and in May, 1908, the Commission entered into contracts to supply them with electricity.

The original 14 municipalities, and the power for which they contracted (rated in kilowatts), were:—

Berlin (746); Galt (895); Guelph (1,865); Hespeler (224); Ingersoll (373); London (3,730); New Hamburg (187); Preston (448); St. Marys (373); St. Thomas (1,118); Stratford (746); Toronto (7,460); Waterloo (511), and Woodstock (895).

It is interesting to recall the names of the chairman and the senior operating official of each of the first Hydro commissions formed by these 14 municipalities:

#### *Chairman*

Berlin	A. L. Breithaupt
Galt	F. S. Scott
Guelph	Samuel Carter
Hespeler	Peter Jardine
Ingersoll	George Sutherland
London	Philip Pocock
New Hamburg	John Hesse
Preston	F. Clare
St. Marys	John Willard
St. Thomas	W. K. Sanderson
Stratford	J. J. Mason
Toronto	P. W. Ellis
Waterloo	Aloyes Bauer
Woodstock	D. W. Karn

#### *Senior Operating Official*

E. J. Philip (Supt.)
Robert Elliott (Supt.)
J. J. Heeg (Supt. & Sect.)
M. E. Jardine (Sec.-Treas.)
Harold Hall (Manager)
F. R. Dark (Supt.)
George Morley (Supt.)
T. R. Waugh (Supt.)
E. J. Stapleton (Supt.)
E. H. Caughell (Manager)
R. H. Myers (Sec.-Treas.)
H. H. Couzens (Manager)
Ford S. Kumpf (Manager)
J. G. Archibald (Manager)

A MINIATURE REPLICA of Niagara Falls was erected over the main entrance of the city hall for the inauguration of Hydro service in Toronto shortly after 8 p.m. on May 2, 1911.



At the outset, the Commission assumed the role of distributing agency for power purchased on behalf of the municipalities from the Ontario Power Company at Niagara Falls.

This arrangement placed a block of 75,000 kilowatts at the disposal of the Commission for immediate and future needs. This contract provided for purchase at the generating site, as Ontario Hydro was prepared to build its own transmission system to deliver power to the municipalities.

The first Hydro power was officially turned on at Berlin (Kitchener) on October 11, 1910. The ceremony was one of the most impressive ever held in Ontario. An august assembly such as had rarely gathered even in the larger cities, was suddenly transformed into a wildly-cheering crowd as Sir James Pliny Whitney, Prime Minister of Ontario, graciously transferred the honor of pressing the button to Hon. Adam Beck, and the Niagara River made a token contribution significant of what it would do for the people of the province in the years to come.

Deliveries of power to other municipalities — Guelph, Hamilton, London, Preston, Stratford, Waterloo and Woodstock — followed in quick succession.

At that time, the Ottawa and Hull Power and Manufacturing Company was also under contract with Ontario Hydro to supply 3,000 kilowatts to the City of Ottawa. Meanwhile, a short transmission line and a substation were built by the Commission to serve

HILDA RUMPEL (now Mrs. Landor Reade, Toronto) presented a push-button on a small cushion to Premier Whitney for the Berlin "switching-on" ceremony in 1910.



CROWDS LINED BERLIN'S GAILY-DECORATED STREETS FOR THE PARADE PRIOR TO THE 1910 CEREMONY.

donia, Mimico, Norwich, Port Credit, Port Dalhousie and Port Stanley were added to the growing Hydro family that numbered 35 municipalities by the end of that year.

### Municipal Campaigns

It was seen from the first that if support were to be forthcoming from every part of the province — and there was every reason to believe that it would be, since the creation of the Commission was based on popular demand — then not only new sources of power would have to be developed, but the plants of private interests serving various localities would have to be acquired. The whole situation called for serious investigation and campaigning.

Injected into this whirlwind of activity — for such it may truly be described — were R. T. Jeffery, (who had succeeded P. B. Yates as Municipal Engineer) and his staff. Reinforcements were continually thrown in from other divisions by Chairman Adam Beck, who, himself, was "here, there and everywhere" addressing audiences and producing evidence to show the benefits and advantages to be derived from low-cost Hydro power.

The policies of the Commission from the beginning were based on democratic principles. The first step was for the municipality to pass an enabling by-law as provided by the Power Commission Act. Before this by-law was submitted to popular vote, meetings were arranged at which all details with respect to the proposed electrical services were explained to the citizens by Adam Beck or his lieutenants. The advantages to be derived from Hydro power were demonstrated and any possible misunderstandings cleared up. If the vote of the people were favorable, the Commission, as authorized under the Act, entered into a contract for the supply of power to the municipality, and arrangements were usually made for the purchase by the local commission of any existing plant.

Once a municipality had entered the Hydro family, the expansion and improvement of the municipal distribution system to meet anticipated industrial expansion and the requirements of commercial and domestic customers were largely in the hands of the local commission. All this necessitated a close co-operation with Ontario Hydro and the furnishing of data, which would indicate the trend of de-

Port Arthur with power purchased from the Kaministiquia Power Company. The two pioneer systems — the Niagara area in the south and the Port Arthur district in the north — eventually grew into the Southern Ontario and Thunder Bay Systems.

Public acceptance was reflected in the successful financing of further transmission line construction, making possible the delivery of Niagara power in 1911, to Brampton, Dundas, Galt, Hespeler, Ingersoll, Midland, Mitchell, New Hamburg, Penetang, St. Marys, St. Thomas, Seaforth, Tillsonburg, Toronto, Waterdown and Weston. In 1912, Acton, Baden (Beck's native village), Beachville, Cale-





△ N HYDRO'S Berlin Transformer Station, Charles Sheppard (now living in Niagara Falls, Ont.) waited for the signal to turn on Niagara power during the 1910 ceremony in the Berlin arena.

△ "THE BERLIN NEWS RECORD" (predecessor of the present Kitchener-Waterloo Record) of October 12, 1910 contained a full account of the launching of Hydro service for Ontario.

△ A PRIZED possession of the Waterloo Historical Society Museum is the push-button used to officially turn on power at Berlin, in 1910, and later at a celebration in Toronto in May, 1911.

development and would enable the Commission to forecast the requirements with respect to power supply. This called for initiative, co-operation and discernment of a high order — qualities which were mirrored in the careers of such men as E. M. Ashworth, Toronto; E. V. Buchanan, London; H. H. (later Sir Hubert) Couzens, Toronto; Ross Dobbin, Peterborough; J. Clark Keith, Windsor, and R. H. Martindale, Sudbury.

In recognition of their contributions to the field of engineering and to Ontario's publicly-owned hydro systems, Ontario Hydro has named three large and important transformer stations at London, Peterborough and Sudbury in honor of Messrs. Buchanan, Dobbin and Martindale, while Mr. Keith has been honored by the naming of the commission's thermal-electric station at Windsor.

### Services to Municipalities

Electrical services to the expanding Hydro municipal systems have

been provided in three ways — by the acquisition of the plants of private power producers and by developments carried out by the Commission itself, as well as by the purchase of power from other sources.

Early demand for Hydro services by the municipalities in the Georgian Bay district resulted in the purchase and improvement of electric power systems operated by private enterprise and in the construction of the Commission's first waterpower developments at Wasdell Falls and Eugenia. In Central and Eastern Ontario, the acquisition of the plants of the Electric Power Company and later of the system operated by the M. J. O'Brien Company enabled a large number of municipalities to enjoy the benefits of electric power at lower rates. In northern Ontario, the Commission, acting as trustee for the Ontario Government, acquired and rehabilitated the plants of early power producers operating in the Sudbury area. In

1933 it acquired the uncompleted Abitibi Canyon plant of the Ontario Power Service Corporation, and in 1945 assumed operation of the system of the Northern Ontario Power Company serving the mining communities in the Temiskaming district. North of Lake Superior, the Commission served the Lakehead City of Port Arthur as early as December, 1910, through power purchased from the Kaministiquia Company whose plant it finally acquired in 1949.

### Vast Power Pools Created

In the early days, the Hydro municipalities were restricted to the services that could be provided from more or less adjacent power sources. This led to inequalities of distribution and sometimes affected the growth and development of communities. Major power developments carried out by the Commission at strategic locations on the great rivers of the province and the construction of interconnecting transmission systems have enabled the Commission to overcome

this handicap to progress. The individual systems at first operated by Ontario Hydro have been progressively consolidated through the installation of interconnecting facilities. Today the Southern Ontario System represents one great pool of power served by major power developments at Niagara, on the Ottawa River and in other sections of southern Ontario. Connected with this great reservoir of power is the northeastern Ontario pool. Farther west is another pool of power serving the northwestern section of the province.

The gradual integration of the Commission's generating and transmission facilities throughout the province has been strengthened by tie-ins with Quebec power networks — the Gatineau Power Company, Hydro Quebec and MacLaren Quebec Power Company — from whom Ontario Hydro purchases power on contract. The scope of this growing grid has been further broadened by interconnections with the electrical systems of the Niagara Mohawk Power Corporation in New York State and the Detroit Edison Company in the State of Michigan. An agreement between Ontario Hydro and The Manitoba Hydro-Electric Board for an interconnection between the Commission's North-western Division and two power systems in Manitoba went into effect on October 1, 1956.

The growth of Hydro's municipal system is symbolic of the benefits Ontario Hydro's continuous development and expansion are bringing to the people of Ontario. Since the first contracts were signed with the group of 14 municipalities in southwestern Ontario, other municipal utilities have continued to join the Hydro family. When the Commission entered its Jubilee year, 343 municipal electrical utilities were united with it in a co-operative partnership, bringing the almost incalculable benefits of electricity, with continually improved services, to all classes of customers throughout the province. ■



E. M. ASHWORTH  
Toronto, First  
Secretary-Treasurer  
of the O.M.E.A. and  
A.M.E.U.



G. R. GEARY, Toronto,  
First President of the  
O.M.E.A.



P. B. YATES  
St. Catharines, First  
President of the  
A.M.E.U.



T. J. HANNIGAN  
Guelph, O.M.E.A.  
Secretary-Treasurer  
from 1914 to 1940.

## O.M.E.A. - A.M.E.U.

THE RECORD would not be complete without mentioning those men who have occupied the President's chair of both the Ontario Municipal Electric Association and the Association of Municipal Electrical Utilities.

### O.M.E.A. — Past Presidents

1912 — G. R. Geary, Toronto; 1913 — J. W. Lyon, Guelph; 1914 — Philip Pocock, London; 1915-1919 — T. L. Church, Toronto; 1919-1920 — W. K. Sanderson, St. Thomas; 1921-1922 — W. Ellis, Hamilton; 1923-1934 — C. A. Mäguire, Toronto; 1935 — Jas. Simpson, Toronto; 1936-1937 — F. C. Elliott, Ingersoll; 1938-1939 — G. S. Matthews, Peterborough; 1940-1941 — Dr. W. J. Chapman, St. Catharines; 1942-1943 — K. A. Christie, Toronto; 1944-1945 — W. R. Strike, Bowmanville; 1946-1947 — R. M. Durnford, Sarnia; 1948-1949 — G. F. Hutcheson, Huntsville; 1950-1951 — D. P. Cliff, Dundas; 1952 — F. H. Plant, Ottawa; 1953 — Loftus H. Reid, Toronto; 1954-1955 — Lt.-Col. A. A. Kennedy, Owen Sound; 1956 — Gordon H. Fuller, Windsor.

D. P. Cliff, Dundas, is the present Secretary-Treasurer of the O.M.E.A.

### A.M.E.U. — Past Presidents

1909-1916 — P. B. Yates, St. Catharines; 1917-1918 — E. V. Buchanan, London; 1919-1920 — O. H. Scott, Belleville;

1921-1922 — M. J. McHenry, Walkerville (now consultant, Ontario Hydro); 1923 — A. T. Hicks, Oshawa; 1924 — J. E. Phelps, Sarnia; 1925 — V. S. McIntyre, Kitchener; 1926 — R. H. Starr, Orillia (now Toronto Twp.); 1927 — J. J. Heeg, Guelph; 1928 — J. G. Archibald, Woodstock; 1929 — A. W. J. Stewart, Toronto; 1930 — R. L. Dobbin, Peterborough; 1931 — J. W. Peart, St. Thomas; 1932 — C. E. Schwenger, Toronto; 1933 — T. W. Brackenreid, Port Arthur; 1934 — W. R. Catton, Brantford; 1935 — O. M. Perry, Windsor; 1936 — C. A. Walters, Napanee; 1937 — H. F. Shearer, Welland; 1938 — R. S. Reynolds, Chatham; 1939 — G. E. Chase, Bowmanville; 1940 — A. B. Manson, Stratford; 1941 — C. E. Brown, Meaford (now Hamilton); 1942 — V. A. McKillop, London; 1943 — R. B. Chandler, Port Arthur; 1944-1945 — S. W. Canniff, Ottawa; 1946 — R. J. Smith, Perth; 1947 — J. R. Sullivan, Woodstock; 1948 — J. E. Teckoe, Jr., Windsor; 1949 — J. C. Keith, Windsor; 1950 — R. Butter, Owen Sound; 1951 — M. W. Rogers, Carleton Place; 1952 — R. H. Martindale, Sudbury; 1953 — N. A. Grandfield, Brantford; 1954 — A. W. H. Taber, Fort William; 1955 — H. A. Howard, Thorold; 1956 — E. A. Washburn, Stratford.

W. R. Mathieson, Toronto, is the present Secretary-Treasurer.



# "TRY TO STOP US"

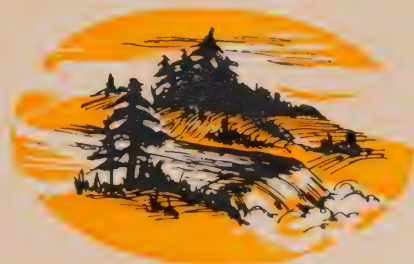
*Prophetic words of Hydro's first Chairman in 1914 keynoted future plant expansion*

"WE ARE OFF NOW," Adam Beck told the audience which had come from far and near for the opening ceremonies. "We are going to build power developments and provide electrical services that will astonish the opponents of the Commission. We are determined to bring electric power at low cost to the industries of the province and to the homes of our people . . . Just let anybody try to stop us!"

These were prophetic words. But when they were uttered by Ontario Hydro's first Chairman in October 1914, at the opening of Wasdell Falls Generating Station on the Severn River, it was in the certain knowledge that the Canadian engineers, surveyors, technicians and staff who had already rallied to Hydro's cause would more than indicate them.

The ceremony at Wasdell Falls was an historic occasion, for the story of Ontario Hydro's first 50 years is largely the story of its generating stations and the men who built them. Although this power source was not the first to be owned and operated by Hydro—that distinction belongs to the Big Chute Station, also on the Severn River, which had been purchased some months earlier from the Simcoe Railway and Power Company — the 750-kilowatt plant at Wasdell Falls was the first to be designed and built by the Commission.

Much of the history of Hydro from its first seeds has to do with the outstanding young engineers and construction men who co-operated in building Hydro's first power structures. F. A. Gaby, Hydro's second Chief Engineer, and Larry Acres, his Hydraulic Engi-



neer, are two of the men who, under Adam Beck, plotted Hydro's early advance. It was Mr. Acres who, under Mr. Gaby, set up the organization for the building of the Wasdell Falls plant and later Eugenia Falls Generating Station on the Beaver River, as well as the Queenston-Chippawa (now Sir Adam Beck-Niagara Generating Station No. 1) development.

Other men who played important roles in Hydro's early days were Arthur D. C. Blanchard, who was field engineer at Niagara and J. B. Goodwin, assistant engineer and works engineer. Such outstanding construction men as George Angell and his assistants, Fred Scriven and Bill Leroy, were also among these Hydro pioneers.

The construction of Wasdell Falls G.S. was at once a training school and a proving ground for Hydro engineers. A log kept at the time tells of the amazing aptitude displayed by the young engineers for handling details of which, to that time, they had only a theoretical knowledge.

Power rights to Eugenia Falls were purchased by the Commission from the Georgian Bay Power Company in 1914. The actual plant was constructed by the Commission and began operation in November,

1915. In the construction of these two early plants the engineers were called upon to exercise great ingenuity. For while Wasdell Falls was built to operate with an average operating head of 12 feet of water, Eugenia had an operating head of 550 feet.

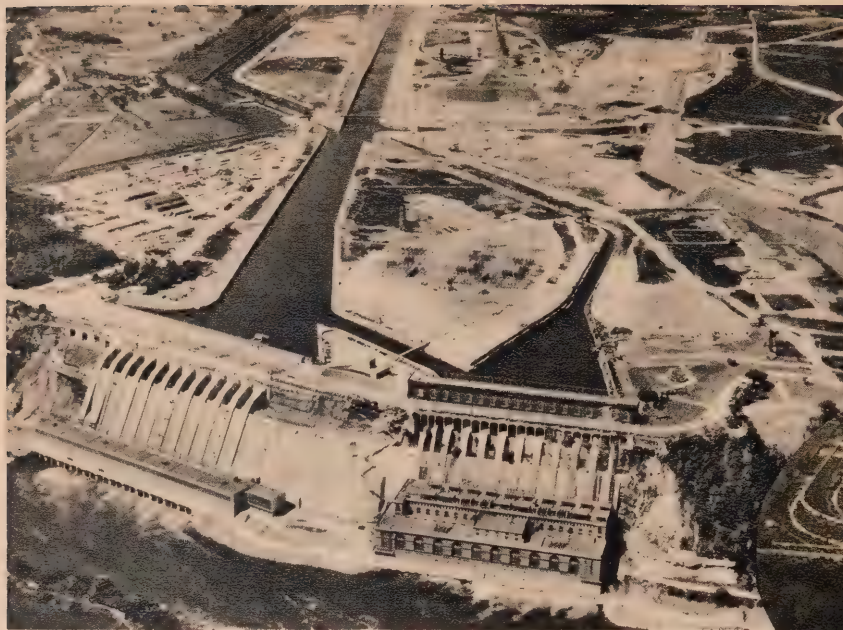
During the early stages of the Commission's development, private enterprise continued to harness hydro-electric resources in various parts of the province. Many of the generating stations later purchased and operated by Ontario Hydro were built by individual power companies.

Among them were: Coniston G.S., built on the Wanapitei River by the Wahnapiatae Power Company in 1905 and purchased by Hydro in 1930; Big Chute G.S. built in 1909 on the Severn River by the Simcoe Light and Power Company and purchased by the Commission in 1914; Seymour G.S. on the Trent River, built by the Electric Power Company in 1910 and acquired by the Commission in 1916; Nipissing G.S. on the South River, Sydney G.S. on the Trent and Auburn G.S. on the Otonabee, all controlled by the Electric Power Company. These latter plants were in operation before 1911 and acquired by Hydro in 1916.

## First Niagara Development

The Commission undertook its first major construction venture in 1917 with the beginning of construction of the Queenston-Chippawa Generating Station, now known as the Sir Adam Beck-Niagara G.S. No. 1, on the Niagara River.





◁ AERIAL VIEW of Sir Adam Beck — Niagara Generating Stations No. 1 (right) and No. 2 shows the marked change in plant architecture since the original station was opened in 1921.



CONSTRUCTION of the Queenston-Chippawa development (now the Sir Adam Beck-Niagara G.S. No. 1, above right) was in full swing when an adventurous photographer took this aerial "shot" in 1921. ▷

Early work on the plant proceeded in the face of difficulties caused by wartime shortages of labor and materials. Since it was the biggest project of its kind ever undertaken up to that time, Hydro needed equipment of a type and size never before designed. The Commission pioneered in developing such equipment as electric shovels with 90-foot booms, 8-cubic-yard buckets and electrically-powered locomotives for hauling. The railway system for the construction of the project consisted of about 82 miles of standard-gauge track.

The acquisition and construction of these plants was dictated by an increasing demand for electricity from the rapidly-growing "family" of municipalities, which were associating themselves with the publicly-owned power system.

For example, when the Commission began supplying electricity in 1910, the demand amounted to approximately 4,000 kilowatts, and total resources were 7,400 kilowatts.

This power was purchased under contract from the Ontario Power Company at Niagara and from the Kaministiquia Power Company in northern Ontario. At this time the Ottawa and Hull Power and Manufacturing Company was also under contract with the Commission to supply 3,000 kilowatts to the City of Ottawa. From that time forward the resources of the Commission and the demands of the province have followed each other in an ever-rising spiral. The availability of low-cost power attracted industry, resulting in greater prosperity for the citizens of Ontario, which, in turn, led to increased demands.

When Canada entered the First World War in 1914, the Commission's primary power demands, although greatly increased over the 1910 level, were still only 68,100 kilowatts, and total resources were 75,650 kilowatts, of which only about five per cent was available from Hydro's own plants. By the end of the war, primary demands

had more than tripled, to 221,300 kilowatts, and 65 per cent of Hydro's resources were available from the Commission's own generating facilities. This was accomplished, in part, by the Commission's purchase, in 1917, of the 135,000-kilowatt plant of the Ontario Power Company, the source of its original supply, at Niagara Falls. This supply was augmented in 1922 with the purchase by the Commission of the 108,000-kilowatt Toronto Power Generating Station, also at Niagara, and placed in operation in 1906 by the Toronto Power Company.

By 1923, five units of the Queenston-Chippawa Station were in service and a plant at Cameron Falls on the Nipigon River also had been built. In 1926, Hydro began negotiating a series of contracts with private power companies in Quebec to meet the sky-rocketing demands.

In 1928, only two years after the first Quebec contract had been signed, the Toronto-Leaside Transformer Station was opened, and



electricity was first delivered in October of that year from the Sattineau Power Company.

Meanwhile, several new stations had been built, and work had begun on the joint development of the Chats Falls site on the Ottawa River by Ontario Hydro and the Ottawa Valley Power Company. Existing stations had been enlarged and others, such as the historic DeCew Falls Generating Station, four miles from St. Catharines, acquired by purchase. By the end of 1930 Hydro had brought into service the first two units at its Alexander Generating Station, on the Nipigon River, and for the first time the total resources of the Commission passed the one-million-kilowatt mark. Indicating the tempo of Hydro's power development program was the fact that more than 75 per cent of the power was then available from the commission's 37 generating plants. In the north, the Commission started, during the 1930's, to operate in trust for the Ontario Government a group of unconnected systems, known as the Northern Ontario Properties, which included small generating stations serving mainly mining, as well as pulp and paper industries.

In 1933, the Commission purchased the Abitibi Canyon Generating Station, which now has a capacity of 181,000 kilowatts, from the Ontario Power Service Corporation. These developments gave impetus to northern Ontario industry with the promise of abundant low-cost electricity. In 1945, Hydro's services in northern Ontario were further extended when the Commission took over the operation of the Northern Ontario Power Company facilities.

#### Ontario Looked to Hydro

With the exception of a three-year period during the economic depression, the demand for power upon Ontario Hydro's facilities continued to grow, making it necessary for the Commission either to construct or to acquire additional sources of generation. When the Dominion was plunged into war in 1939, Ontario looked to Hydro to



△ FIRST hydraulic plant designed and built by Hydro was the 750-kilowatt Wasdell Falls station on the Severn River. This pioneer plant was officially opened in 1914.

supply the power to manufacture munitions, military clothing and other war materials. At the outbreak of hostilities, resources amounted to 1,558,500 kilowatts. Primary power requirements stood at 1,317,000 kilowatts, leaving the Commission with a reserve capacity of 241,500 kilowatts. Indicative of the growth that had taken place between the wars, this reserve of power was greater than the Commission's total resources in 1918, the year in which the First World War ended.

To meet the wartime demand, three new developments were undertaken: Big Eddy on the Muskoka River, Barrett Chute on the Madawaska and a new station adjoining the old plant at DeCew Falls. With the additional power made available for essential services through the restrictions imposed at the request of the Canadian Government, as well as by the operation of existing plants at maximum capacity and the negotiation of further power contracts with other



△ Kaministiquia Generating Station has supplied power—purchased by Ontario Hydro—to Port Arthur and other Lakehead customers since 1910. The Commission acquired the plant in 1949.

sources, Hydro contributed in no small measure to the nation's war effort.

#### Postwar Expansion Program

The way was paved for the construction of new power plants on the Ottawa River in 1943 with the signing of an agreement between Ontario and Quebec pertaining to the water powers of that river. The agreement divided the Ottawa's available power potential as evenly as possible between the two provinces. Ontario was allocated power sites at Cave and Fourneaux, Des Joachims, Chenaux or Portage du Fort and the upper half of Paquette. Quebec obtained Rocher Fendu, Carillon and the lower half of Paquette. In the same year, Ontario Hydro completed its preliminary surveys and investigations for the development of the Des Joachims site.

Immediately following the end of the war, the Commission began work on eight major developments, which were either totally new



AN IMPORTANT milestone was the official opening of the Queenston-Chippawa development (now the Sir Adam Beck-Niagara Generating Station No. 1) on December 28, 1921 by Miss Marion Beck and Ontario Premier E. C. Drury.



F. A. GABY, Chief Engineer, left, inspected the Queenston-Chippawa project — during the construction period — with Sir Adam Beck, first Chairman, and H. G. Acres, Hydraulic Engineer. Joining Hydro in 1907, Dr. Gaby (he received an honorary Doctor of Science degree from his Alma Mater, the University of Toronto, in recognition of his distinguished services in the hydro-electric field) guided Hydro through some of the most critical and vital periods of its development.

stations or extensions to existing ones, and by October, 1948, three of these had been placed in service. Hydro's expenditures on capital construction in the first three post-war years were 50 per cent greater than the combined total of the largest producers in the steel, chemical and oil industries of Ontario between 1939 and 1948.

Ontario, between 1948 and 1949 was faced with a serious energy deficiency imposed by low-water conditions, phenomenal industrial activity and a variety of new post-war electrical applications for use in the home. To meet this situation, the Commission installed emergency fuel-electric generating stations in heavily-industrialized Ontario centres. These added

47,000 kilowatts of electric power to the Commission's resources. At this time also, construction was begun on two major thermal-electric stations, the J. Clark Keith station at Windsor and the Richard L. Hearn station in Toronto—the latter being the largest in Canada. In addition, construction of new post-war hydro-electric projects was accelerated.

The year 1950 was one of great significance for the Commission. Within a two-week period in June, three of the new postwar generating stations were officially opened: the George W. Rayner station on the Mississagi River, Pine Portage Generating Station on the Nipigon River and the Des Joachims Station on the Ottawa River. Five months later, the Chenuaux Generating Station, also on the Ottawa, was placed in service. In one year the generating capacity of the Commission had been increased by 477,400 kilowatts, the largest increment in

any one year of Hydro's history up to that time.

### Niagara Diversion Treaty

Perhaps the most significant event of 1950, however, was the signing of the Niagara Diversion Treaty between Canada and the United States. This marked the beginning of an epochal chapter in the history of the Commission's development of the power resources of the Niagara River.

Under the terms of the former treaty the diversion of water for power purposes was limited to a fixed amount, regardless of the flow in the river. The new treaty, however, provided that a fixed amount of water must be permitted to flow over the falls — the amount being greater during the day in the tourist season; the remaining water is divided between Canada and the United States for power purposes. In this manner the scenic beauty of the falls is preserved and max-



num use is made of the available low in the river for power generation.

This treaty made it possible for Hydro to plan and begin construction of its largest power project — the Sir Adam Beck-Niagara G.S. No. 2. Officially opened in August, 1954 by H. R. H. The Duchess of Kent, the new Niagara plant had, by 1955, an installed capacity of 100,000 kilowatts. In January, 1956, the Commission announced plans to install four additional 75,000-kilowatt units in the main powerhouse making a total of 16, which, together with the associated pump-generating station, to be completed in 1957, will give the project an ultimate installed capacity of 1,370,000 kilowatts in 1958. More power will be derived from this single development than from the Commission's total resources in 1936.

Hydro's second largest postwar project, the St. Lawrence Power development, is now under construction and scheduled for initial service in the late summer of 1958. The Commission began investigating the St. Lawrence as a power source in 1913, only seven years after Hydro came into being. From these early studies came the first formal statement on the power potential of the International Rapids Section. Following this report in 1921, the International Joint Commission recommended the appointment of a Joint Board of Engineers, comprising three members from Canada and three from the United States, to determine the manner in which the river's power potential could best be harnessed.

Acting on the report of this board, representatives of both countries signed a St. Lawrence Deep Waterway Treaty in 1932 but the treaty was not ratified. Finally on December 3, 1951, the Canadian and Ontario governments signed an agreement whereby Ontario was to construct and operate power works in the International Rapids Section. In July, 1953, the U.S. Federal Power Commission granted the Power Authority of the State

of New York a licence to develop the St. Lawrence in conjunction with Ontario Hydro. On June 7, 1954, this licence was sustained by the United States Supreme Court, thus removing the final legal obstacle.

Construction on the project was begun on August 10, 1954. The Ontario Hydro half of the development, which is to have an installed capacity of 820,000 kilowatts, will be known as the Robert H. Saunders-St. Lawrence Generating Station in memory of Hydro's late Chairman who worked so hard for the realization of the project.

### Northern Developments

Toward the end of 1953 construction began on a new 54,400-kilowatt generating station at Manitou Falls on the English River in northern Ontario. This plant—the first Commission station designed for remote, radio-controlled operation — was placed in service in March of this year; a fifth unit, to be completed in 1958, will increase its capacity to 68,000 kilowatts. In the summer of 1955 construction of a 54,000-kilowatt station at Whitedog Falls on the Winnipeg River near Kenora was authorized. The power resources of Hydro's Northwestern Division will be further augmented by the completion in 1958 of additions totaling 31,500 kilowatts to the existing Cameron Falls and Alexander Generating Stations on the Nipigon River, as well as initial service of a new 75,000-kilowatt plant at Caribou Falls on the English River.

Mounting demands for power also made it necessary recently to authorize three, 200,000-kilowatt units for the Richard L. Hearn G.S. in Toronto, which will bring the ultimate capacity to one million kilowatts.

### The Present and the Future

Today Ontario Hydro operates a total of 65 hydro-electric and two major thermal-electric generating stations. By the close of last year, the Commission had resources of 3,846,000 kilowatts from its own



△ PLACED in initial operation in 1898 and acquired by Hydro in 1930, the original Decew Falls Generating Station (right) and the new plant, completed in 1947, are located on Twelve Mile Creek near St. Catharines.



△ STEAM SHOVELS, raised and lowered by steel chains, and "continental" dump cars, hauled by "dinky" engines, were used in construction of the Eugenia Falls station in 1914.



△ RECENT Commission approval of a seventh unit for Cameron Falls Generating Station on the Nipigon River recalls completion of the initial unit at this first Hydro-built plant in northern Ontario during December, 1920.



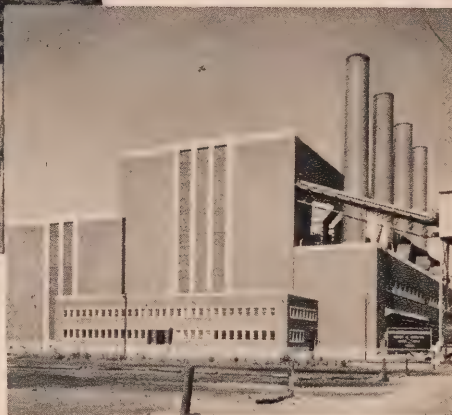


SINCE Christmas Day, 1929, when the first unit came into service, Hydro's Ear Falls Generating Station on the English River has had a leading role in the development of the mineral resources of northwestern Ontario. It now has a dependable peak capacity of 20,600 kw.



THREE major hydraulic plants were placed in service in June, 1950, including the 372,000-kilowatt Des Joachims G.S. on the Ottawa River.

CANADA'S largest thermal-electric station, the Richard L. Hearn Generating Station in Toronto, with an installed capacity of 400,000 kw. in four units, came into initial service in 1951.



generating plants, and this power together with the 684,500 kilowatts purchased from outside sources brought its total capacity up to 4,530,500 kilowatts.

By 1980 it is estimated that the Commission's total resources may be as high as 23.6 million kilowatts. Of this amount, only 5.5 million kilowatts from hydro-electric stations appears to be economical. The balance will be obtained from thermal-electric generation and only the future can determine the exact division between conventional and nuclear-electric generating sources.

In March, 1955, a decision was made to build a 20,000-kilowatt nuclear power plant which will be located near Hydro's Des Joachims G.S. on the Ottawa River. Known as "NPD"—Nuclear Power Demonstration—this pilot station will be built by Atomic Energy of Canada Limited, Ontario Hydro and the Canadian General Electric Company Limited. It will represent the culmination of feasibility studies conducted at Chalk River by Hydro and other engineers working in close co-operation with Atomic Energy of Canada Limited, through which organization the Commission's Chairman, Dr. Richard L. Hearn, was appointed a Director in 1952.

Within the next decade, when it is anticipated that nuclear power stations will become economical for base load operation, Ontario Hydro will be ready with the engineer's determination and the know-how to harness this new and revolutionary source of power. The words of the late Sir Adam Beck apply as well today as when they were first uttered — "... Just let anybody try to stop us!"



ARCHITECT'S sketch of the St. Lawrence powerhouses which are now under construction in the International Rapids Section near Cornwall.





# POWER AND INDUSTRY

BEHIND Ontario's emergence as the "production giant" of Canada lies the saga of an ample concentration of natural resources and the significant contribution of a vital commodity known as low-cost electric power.

Canada's second largest province, Ontario today accounts for almost half of the gross value of Canadian manufacturing production. Almost one-quarter of all the nation's primary production — agriculture, lumbering, etc. — is also contributed by Ontario.

This dominant position was attained by a gradual, almost imperceptible process of development, stretching back across several decades.

A vast portion of the province consists of the rocks of the Precambrian Shield, being unsuitable for agricultural purposes, except to a minor extent.

It is not surprising to learn, therefore, that approximately 91 per cent of Ontario's five and one-quarter million people live in southern Ontario, an area of some 40,000 square miles, lying south of the Shield and adjacent to the St. Lawrence River and the Great Lakes.

## Economic History

This section, representing about one-tenth of the total area of the province, first witnessed the clearing of great timber stands, which gave way to rich agricultural land. Substantial wheat crops were harvested here long before the prairies beckoned and this brought about the establishment of market towns, many of them destined to become flourishing cities. These productive

acres provided nourishment for an increasing population, which, in turn, created a market for manufactured products.

Thus, today, southern Ontario has become the fulcrum of the Canadian industrial complex. Last year, for the first time in history, the gross value of manufactured goods produced in Ontario passed the \$9 billion mark.



△ TAPPING a large electric furnace in an Ontario steel mill provides one of the most spectacular sights found in modern industry



△ NICKEL mines of northern Ontario, which yield almost 90 per cent of the world's supply of this commercially-important metal, are among the Commission's major industrial customers.



While southern Ontario stands pre-eminent as a manufacturing area, it is northern Ontario that has placed the province in a foremost position throughout Canada in mineral production.

The discovery of copper in 1883 was followed closely by nickel and platinum. Gold and silver mining came into prominence early in the new century, while important iron ore discoveries in later years have made valuable contributions to the mineral output of the province.

Ontario, as one of Canada's leading sources of metals, now produces 90 per cent of the nickel in the free world, while 50 per cent of Canada's copper, gold, silver, iron, calcium, magnesium, cobalt and the entire group of platinum metals are mined in Ontario. In 1955, this province was responsible for 32.5 per cent of Canada's mineral production for a total of \$578 million.

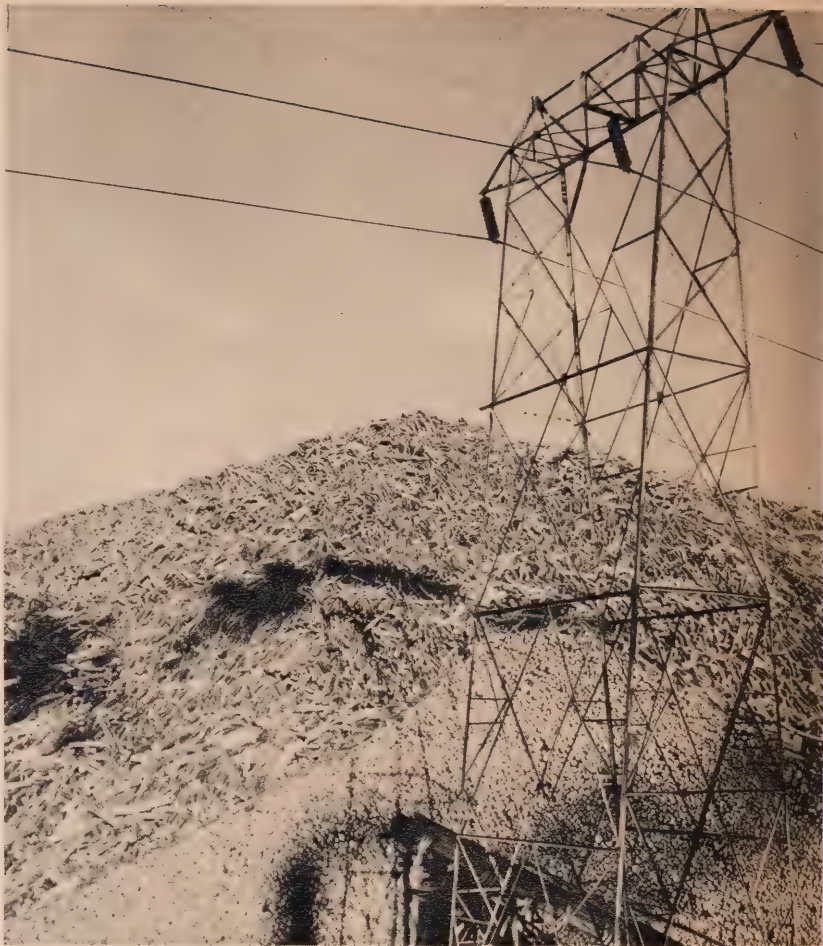
From the great forest areas of northern Ontario, covering almost 155,000 square miles and estimated to contain accessible stands of more than 53 billion cubic feet of softwood and 29 billion cubic feet of hardwood, come the raw materials for Ontario's vast and growing pulp, paper and saw mills. These mills rate among her major primary industries.

To Ontario Hydro, now supplying some 90 per cent of the total primary requirements supplied by central electric stations in Ontario, has fallen the task of meeting the demands imposed by this new industrial tempo.

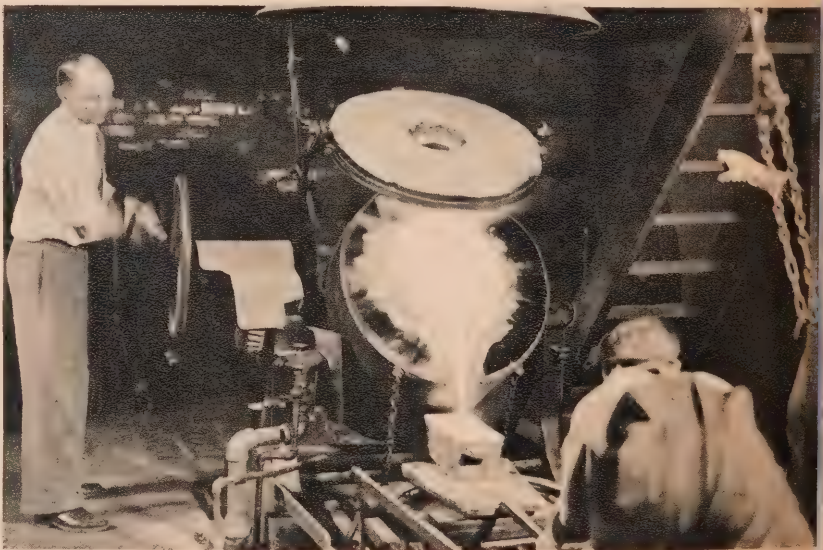
### Direct Supply

Since 1910 when Ontario Hydro first began supplying power to scattered municipalities in southwestern and other sections of Ontario, it has been called upon to supply power directly to certain industries, mines and rural areas, as well as a growing number of associated municipal electrical utilities.

This has entailed construction of many new generating plants (as described in the chapter, "Try to Stop Us . . ." on page 19), and the



IN 1955 Ontario Hydro supplied power directly to 19 large pulp and paper mills. This branch of industry annually makes a significant contribution to the provincial economy.



POWER plays a dominant role in the operations of Ontario's gold mines. Here molten gold poured from an electric furnace into a mould before shipment to the Canadian mint at Ottawa.



acquisition of other privately-owned sources of power. The growth of the Commission's northern systems began in a concrete way with the acquisition by the Ontario Government of the assets of the Electric Power Company in 1916. Hydro operated these facilities until 1928 when they were purchased from the province and certain plants were integrated with the Commission's existing Nipissing system. In 1929 Hydro brought its Far Falls Generating Station on the English River into operation to serve new gold mines in the far distant Patricia district of northwestern Ontario. It had already developed a site at Cameron Falls on the Nipigon River in 1920 and in 1930 brought in the Alexander Generating Station to serve the industrial load of that area.

Since then this network of new and acquired stations has grown to meet the demands of industry in both the southern and northern sections of the province.

#### Ultimate Customers

At the end of 1955, the Commission was serving a total of 1,540,011 customers either directly or indirectly. This total included 24,114 power customers, of which 196 were direct industrial customers of Ontario Hydro.

These 196 direct industrial customers consisted of the following categories: Pulp and paper — 19; Mining (gold — 33), (silver and cobalt — 18), (base metals — 14), (uranium — 5), (non-metals — 4) — 7; Quarrying (cement and basic building materials) — 15; steel and electro-metallurgical — 7; Abrasives — 4; Chemical, electro-chemical and dynamite — 15; Grain elevators and milling — 4; Transportation services and communications — 8; Government services and institutions — 11; General manufacturing — 30; Export — 4, and Miscellaneous — 5.

These direct industrial customers received 44 per cent of the total 24,115,846,832 kilowatthours of electric energy supplied by the

Commission last year. Reaching an annual total of more than 7 billion kilowatthours, these direct industrial customers set a new record in primary energy consumption, exceeding the 1954 figure by better than 17 per cent.

These facts constitute a reliable yardstick of Ontario's economic development. The acknowledged role of Hydro and its main commodity — abundant electric power

— in promoting this expansion has been emphasized on numerous occasions by impartial observers.

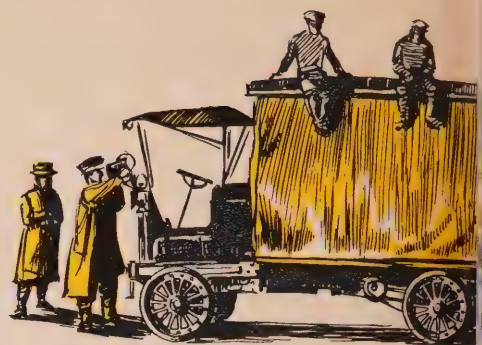
A few months ago, N. R. Crump, President of the Canadian Pacific Railway, during a ceremony marking completion of a new railway line to serve the mining community of Manitouwadge, 275 miles east of Port Arthur, said: "We would not be rolling back the frontiers without the help of electricity." ■



△  
MOLTEN calcium carbide pours from a modern electric furnace at the North American Cyanamid Ltd. plant at Niagara Falls, Ontario, one of Ontario Hydro's direct industrial customers.

# THE FARMER TAKES

Adam Beck's "Circus" travelled many miles selling  
electricity to the farmers . . . . Today a mammoth  
Hydro network serves the province's rural areas



BACK IN THE LATE SUMMER and fall of 1912, when the people on the farms and in the rural communities of southwestern Ontario spoke of the "circus coming," they were thinking, in most instances, not of the "three-ring" affair, with its calliope, acrobats, clowns and menagerie. They were eagerly awaiting the arrival of Adam Beck's travelling caravan, which represented an unique pioneer effort to interest them in the benefits and advantages of electricity.

As early as June 25, 1912, the Board of Trustees of Beachville, which was celebrating the inauguration of Hydro services, had co-operated with Ontario Hydro in arranging an exhibition and demonstration of electrical equipment. The display attracted a good deal of interest. Various types of household electrical apparatus were shown in operation. Refreshments were prepared with the use of an electric stove. A cow was milked by an electrical machine and the cream was distributed, so long as the supply held out, with the tea and coffee.

The Hydro exhibit at Beachville was followed up by displays and demonstrations at the Canadian National Exhibition, and at the fall fairs at London, New Hamburg, Stratford, St. Marys, Norwich, Woodstock, Weston, Tillsonburg, Markham and Dundas. Such was

their success that it was decided to make these demonstrations a permanent feature of Hydro publicity. In recent years, the scope of these exhibitions has been tremendously enlarged to include models and graphic representations of the vast power developments upon which Ontario Hydro has been engaged in the interests of the people of the province.

## The "Hydro Circus"

Adam Beck, however, was anxious to supplement exhibits at fairs by demonstrations that would more directly emphasize the uses to which Hydro power could be put on the farm. He decided to have two mobile outfits built to travel the rural roads and visit farms so located that power could be tapped from low-voltage Hydro transmission lines. Hydro engineers immediately set to work on their design.

Each outfit was composed of two covered waggon's constructed to meet — insofar as it was possible to anticipate them — the varying conditions that would be encountered on unpaved country roads and concession lines. One of these waggon's was equipped with motors and the other with two, 15-kilowatt transformers capable of handling power at 2,200 volts and stepping it down to 220 and 110 volts. Various devices protected both the

equipment and the operators. The caravans were horse-hauled. The horses, which had an onerous task to perform, were changed from time to time as in the old coach days. A three-ton, 50-hp. gasoline-drive truck was purchased and attached to one of the outfits. It carried Hydro speakers and also auxiliary equipment for farms that might be lacking in some of the tools and appliances whose operation by electric power it was intended to demonstrate. When relays of horse were not readily available (the caravans worked on a very tight schedule) the truck was available to replace them.

A trial demonstration with these mobile outfits was held at the Migh farm in Toronto Township on August 28, 1912, in the presence of the Hon. Adam Beck, Hon. J. S. Duff, Minister of Agriculture, other members of the Ontario Cabinet and officials of Toronto Township. The caravans then started on their adventurous journeys.

In charge of the movements of No. 1 section of the Hydro "Circus," as it soon came to be known, was James Stanley Lotimer, whose death, while still on the Commission's active staff, occurred in 1954 while J. W. Purcell, who had an impressive knowledge of conditions on the farm and could talk to the farmers "in their own language," directed the demonstrations. Adam



# A LINE



DEMONSTRATING the benefits of electricity on the farm, this three-ton Gram truck, carrying equipment ranging from a circular saw to a washing machine, with a horse-drawn transformer wagon and motor wagon, was a feature of Hydro's two travelling "circuses" in 1912.

Jack, drew up the schedules, personally supervised the arrangements and was usually present when the demonstrations were carried out.

On the uncertain roads of those early days, it is not surprising that the "Circus" met with mishaps from time to time. Yet in the tradition of the "show must go on," somehow the "Circus" arrived on schedule, and the "performance" went on to enthusiastic applause. Between August 30 and October 14, 1912, demonstrations were staged at eight farms scattered through Toronto, North Dumfries, Wilmot, Ebbert and South Yarmouth Townships, and also at the New Hamburg, Stratford, and St. Marys fairs and at the London Sanitarium. It is proudly recorded: "All scheduled dates were met."

Heading the activities of No. 2 Section was H. D. G. (later General) Crerar, who, in 1912, was Director of the Commission's Laboratory.

As this section of the Hydro "Circus" was more especially assigned to demonstrations at county fairs, it was provided with marquees and a small commissary service. A home economist was loaned by the Canadian General Electric Company. General Crerar, fully recalling his "Hydro days," remembers that "when we camped in a town, we usually invited the dignitaries to a little party at



ST. THOMAS pupils had a school holiday in October, 1912 to witness this electric milking demonstration at the farm of Mr. and Mrs. Alex Anderson. Hon. Adam Beck is second from right.

which the lady gave demonstrations in the art of cooking by electricity. I remember that at a luncheon held in London, Sir Adam Beck, H. J. Glaubitz, E. V. Buchanan and myself sat down to what must have been one of the first completely electrically-cooked meals in Ontario."

In addition to demonstrating at many farms, the second section of the Hydro "Circus" attended 11 exhibitions in Oxford, Norwich and Dereham Townships.

## Rural Campaigns

The demonstrations given by the "Circus" and at the county fairs showed that electricity could be used effectively to lighten and speed up many laborious tasks about the farm and vastly improve living conditions. A serious problem, however, still awaited solution — the cost involved in providing services.

Farms in close proximity to municipal and township Hydro systems were served through extensions. The demand for this type



of service naturally increased after the initial Hydro demonstrations. Reaching the vast majority of farms necessitated expanding rural construction programs beyond the means and volition of the municipalities. Private power producers had shied away from such enterprises because they involved construction and maintenance costs disproportionate to revenue. Adam Beck conceived it to be the duty of the Commission to bring power to the rural areas — an undertaking which he regarded as economically feasible, providing sufficient support and co-operation from the farmers were assured.

Following the introduction of the "Circus," more than eight years of persistent campaigning were required to achieve the objective, with the theatre of operations continually broadening as the Commission carried out new power developments and acquired private systems mainly throughout southern Ontario.

The keen interest taken by Ontario Hydro in the farmers of the province was strikingly evi-

denced by both the number and the type of men employed in this rural campaigning.

Some had been born or brought up on Ontario farms and were personally familiar with the conditions under which farmers were laboring. The others were all experienced engineers, capable of determining the facilities required to bring power to the farmers.

#### Rural Grant-in-Aid

In 1920, the Ontario Government prepared the ground for the rural services Ontario Hydro had in mind by an amendment to the "Rural Power Distribution Act," enabling the Commission to organize rural operating areas. The province was divided into rural districts of about 100 square miles each. These districts were to be operated by Ontario Hydro as a unit with its own power cost and its own accounting and rates, which were to be adjusted from time to time, on a cost basis. All applications for service were signed for a 20-year period.

This plan was made effective as far as Hydro construction programs

were concerned when, in 1921, the government passed an amendment to the Power Commission Act. The amendment provided for a grant-in-aid of 50 per cent of the cost of all primary lines serving rural customers, and helped not only to encourage the use of power but also to keep at a reasonable and equitable level the cost of such power to the farmer.

In 1924, the government extended the 50 per cent grant-in-aid to cover the cost of all lines, both primary and secondary. This brought about a further reduction in service charges. In 1930, the provincial legislature passed an act setting a maximum service charge. In 1936, the farm service rate was further reduced, and finally, on January 1, 1944, the farm service charge was eliminated.

In 1943, the Ontario Government approved legislation providing for the introduction of uniform rural power rates throughout Ontario. These rates became effective January 1, 1944. The objective was to make power available to farmers in sparsely-settled areas.



A MOTOR WAGON in the travelling "circus" gave this corn-cutting and silo-filling demonstration in Oxford County in 1912. The cable (foreground) linked the motor wagon to the Hydro transformer wagon.



nd, at the same time, eliminate nequalities of rates among rural customers.

### Growth of Rural Hydro

Figures tell an impressive story of growth in the number of customers and miles of line used to provide these customers with adequate service. In 1945 there were 1,569 miles of rural line serving 56,560 rural customers. At August 1, 1956, there were 44,150 miles of line, serving 427,160 customers . . . In eleven years, more than double the miles of rural line, and almost three times the number of customers. Consumption of electricity on the farms has gone up by leaps and bounds. This is not surprising when it is remembered that there are now more than 400 uses for electricity on the modern farm.

At the same time, Hydro's rural service has also contributed substantially to the growth of the tourist industry in this province, through the benefits of electricity made available to resort areas, which are served as part of the Hydro rural system. It is recognized that, but for Hydro's continual rural expansion, many of these resort areas could not have been economically supplied with electricity.

Advances in electronics and new applications of electricity lead many to envisage an even greater "electrical day" dawning for those who dwell in the rural areas of Ontario, where Hydro has already helped to provide a standard of living second to none.

The words of Adam Beck echo down the years from the time when he spoke to a gathering in his honor at London in 1913: "If I have helped the farmer to make his farm more attractive, to help keep the boys and girls on the farm, then I have not labored nor have you co-operated with me in vain."

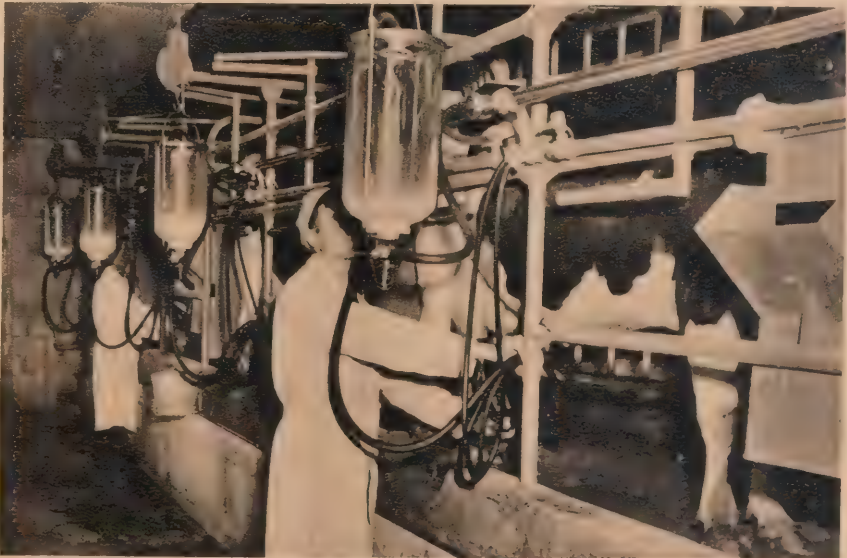
In THIS Ontario milking "parlor" the milk is piped from the glass containers — after weighing — through a stainless steel pipe (second from top) by an electric centrifugal pump.



△ MANIFESTING the beneficial effects of Hydro service, the fine farm of M. W. Keefer near Galt was among the first to receive electricity in Ontario. At that time — 1911-1912 — the farm was owned by Mr. Keefer's aunt, Miss Catherine Wilkes, and was famous for its standard-bred horses.



△ THIS electric bale elevator at a Waterloo Township dairy farm near Kitchener, used for storing hay, is one of some 400 possible applications of electricity on a modern Ontario farm.





# MEETING THE

From pioneering experiments in concrete-mixing to the development of an electric fly trap, Ontario Hydro's research engineers have made many notable contributions to Canadian science and engineering

ONTARIO HYDRO is a many-faceted organization, and not the least among its activities is the part Hydro research has played in the development of the province's sources of electric power. At the same time, many of the techniques and innovations developed in the Commission's laboratory have made a far-reaching contribution to Canadian engineering and scientific progress in both war and peace.

The Research Division had a humble beginning back in 1911 when Sir Adam Beck prevailed upon a then comparatively unknown young man named H. D. G. Crerar to join Ontario Hydro in a position described as Illuminations Engineer. Today, the Research Division has a staff of about 300 highly-trained personnel. Under the directorship of Gordon B. Tebo until June 1 this year, and now under the acting directorship of H. C. Ross, this division ranks with the outstanding organizations of its kind in the world.

The first laboratory was set up in 1912 in the basement of the Commission's transformer station on Strachan Avenue in Toronto. It was headed by Mr. Crerar, who had a staff of one to assist him with the work of testing and experimenting. The early investigations carried out in that small laboratory seem remote today, but they form part of a continuing process, however; a process, which, at the present time, finds Hydro engaged in the research field in subjects ranging from scientific studies on the mix-



ing of concrete to the development of an electric fly trap.

In the story of the laboratory's growth from a small centre for testing lamps and insulators to its present major function of solving electrical, structural and chemical problems the leading role belongs to Dr. W. P. Dobson. For the entire period of his service with the Commission — from his appointment in 1914 as assistant engineer in charge of the laboratory, through the many years to 1953 as Director of Research, to his retirement in 1955 as Research Consultant — this scientist-administrator was responsible for all research and testing activities within Ontario Hydro.

## Protecting the Customer

Many of the early tasks undertaken by the laboratory have had unexpectedly far-reaching results. Indeed, a major contribution to public safety and property protection began in unspectacular fashion in 1917 when Hydro's electrical engineers expressed grave doubts about the safety of certain electrical equipment in general use, such as enclosed switches, and asked the laboratory to carry out tests. At that time there were no set

standards of quality for such equipment offered for sale in Canada.

Working from first principles, a "approvals staff" of four men, soon to be increased to five, began the lengthy task of formulating standards and specifications and setting up test equipment at the laboratory. This led to the formation in 1917 of the Electrical Inspection Department, headed by Mr. (later Dr. Dobson, to establish safeguard against fire and shock hazard. Thus, Ontario Hydro became the originator in Canada of safety testing for electrical appliances and the Commission's seal of approval could be seen on electrical equipment throughout the Dominion.

By 1940 the approvals work had assumed such a national character that Ontario Hydro — as a provincial body requested the Canadian Standards Association to take it over. This was done — but Hydro's research laboratory continued to act as agent for CSA until 1950 when the Association acquired a laboratory in Toronto and took over about 100 of Hydro's approvals staff to set up its own Approvals Division.

## Assisting Construction

Ontario Hydro designs and constructs many of its generating and transformer stations, distribution facilities, service centres and related structures. Where outside contractors are called in, Hydro specifies the high technical standards to be maintained. Because the construction program is continuous, keeping pace with Ontario's ever-grow-



# TEST

ing power demands, knowledge of the latest improvements in construction practice must be always available.

At the site of a hydro-electric construction project the research staff works quite literally from the ground up. Samples of underlying rock strata are obtained, their type determined and their drilling resistance estimated at the petrographic laboratory. Soil samples are given standard classification tests and measured for such properties as permeability, consolidation characteristics, strength and shear resistance. One aspect of these tests is the assurance that access roads and trafficked areas will be built of the most suitable materials available, with considerable savings later in maintenance costs. Other soil studies to improve design and practice are conducted when earthworks, such as dykes and embankments, are required.

Ontario Hydro's pre-eminence in concreting methods dates back to 1917, at which time a permanent staff was first engaged for the quality control and inspection of all concrete used. Pioneering experiments in the scientific mixing of concrete, replacing the old method of using arbitrary proportions, were first conducted in Hydro's research laboratory. Research engineers have developed automatic equipment for speeding up the testing of concrete's reaction to cycles of freezing and thawing; they also invented the viscoscope, an instrument employing ultrasonic principles to test the condition of concrete structures.



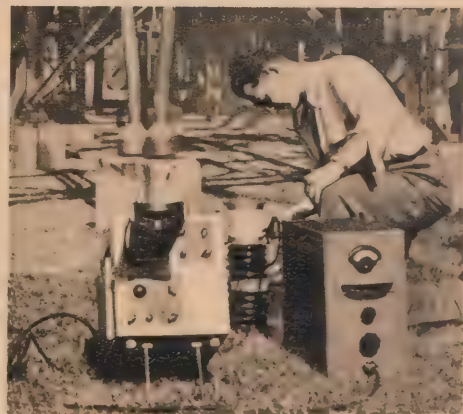
▷ TOOLS for working on live lines are tested regularly in the division's high-voltage laboratory. "Wet" and "dry" flashovers are made on such equipment as insulators, lightning arresters and fuse "cutouts."

▷ SEVERAL thousand miles of high-voltage conductor have been inspected by the bolometer, designed by the Research Division to detect overheated transmission line joints.



▷ THIS water-velocity meter was developed to provide measurements in the range of 2 to 0.1 feet per second during tests at Ontario Hydro's models of the St. Lawrence River.

▷ FAULTS in underground cable may be located by these radar-type instruments (centre foreground). Known as linascopes, instruments of this type have been in routine use since 1949 to detect faults in Ontario Hydro's overhead power and communication lines.





Much of today's knowledge of this structural material is due to the work of the late R. B. Young, Concrete Consultant to the Commission and former Associate Director of Research. Mr. Young joined the Commission in 1913 as an assistant laboratory engineer, and his subsequent career with Hydro until his death in 1954 embraced the complete history of modern scientific methods of concrete construction.

In the course of a construction project the Commission purchases immense quantities of materials and equipment. The Research Division maintains a close check on all items, carrying out laboratory tests on such things as brick, tile, cut stone and other masonry materials. Metallographic examination is made of forgings for generator and turbine shafts and of steel castings for rotating parts, to check the grain structure, adequacy of heat treatment and absence of foreign material.

Before a new generating station is brought into service, thorough acceptance tests of generator performance and efficiency are made to ensure the manufacturer's guarantees have been met. Electrical insulation of generators and cables is checked to establish its adequacy for normal operation. As each new site presents different soil conditions, considerable technical experience is required to make certain that adequate grounding for all electrical equipment is obtained.

As the web of transmission lines begins to radiate from the new power source, Hydro engineers put to practical application the fruits of never-ending research into such things as improved line-grounding methods, better tower design and the suitability of the latest types of clamps, joints and connectors. An innovation in general use on the Commission's new lines is the

"dumb-bell damper" — developed to overcome fatigue failures in transmission-line conductors caused by vibrations of small amplitude set up by wind action.

And when the site has been selected, the concrete placed and the generators humming, the work of the Research Division is still not ended. An extreme example of research foresight is the placing in a special "cemetery" of samples of the two million cubic yards of concrete used in constructing the Sir Adam Beck-Niagara G.S. No. 2. These samples, which include concrete from most of Hydro's post-war projects, will be tested at periods ranging up to 100 years.

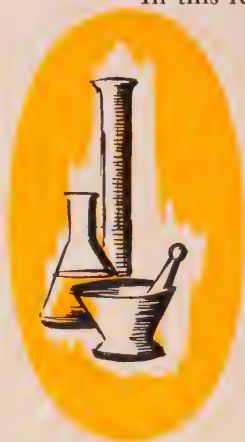
### Transmission and Distribution

Many problems arise during the generation, transmission, distribution, utilization and metering of electric energy. Their solution frequently requires the development of new testing equipment and the modification of existing techniques. In this respect the research labora-

tory has developed and is still developing numerous instruments involving the complex techniques of electronics.

Of special note among these are two, which play an important role in line maintenance: the portable bolometer, which measures infra-red radiation from transmission line joints and indicates any deterioration due to excessive operating temperature; and the linascope, an instrument utilizing radar principles to locate short circuits in faulted power lines.

Switching operations are studied to devise measures for protecting equipment from the short duration surges of electric power, which arise from lightning strokes. Simulated lightning tests of distribution transformers and performance tests of lightning arrestors are but one part of a program designed to minimize the number of service interruptions.



A recent major development is the operations recorder, which the laboratory designed to facilitate power station operation. The recorder makes possible considerable reductions in the size of annunciator boards and meter panels, and automatically produces a printed record of station operation through an intricate system of relays and electronic tubes. The printing instrument can register as many as 1 relay operations per second; if this frequency is exceeded, the remainder are stored in "memory" circuit for subsequent printing.

### Versatility of Research

To adequately fulfil the demand made upon it by an organization with such wide ramifications as Ontario Hydro, the prime requisite of a research laboratory is versatility. A partial inventory of the items tested and reported upon at a Strachan Avenue will aid the reader in assessing the degree to which this attribute has been developed there. The list covers line hardware; wire and cable; rope; safety equipment including live-line tools, linemen's rubber gloves, safety belts, and protective helmets for construction workers; structural components; paints and other protective coatings; preservatives for wood, leather, and textiles; electrical and thermal insulants; petroleum products of all types; fuels; insulating and lubricating oils; plastics and adhesives; anti-freeze liquids; soaps and detergents; protective hand cream — in fact, all the way down the scale to such mundane products as floor waxes and tableware.

In addition to its regular activities, the Research Division also has a major responsibility in acting as agent for the Department of National Defence in its program of approval testing of radio and radar components.

### Agricultural Aspects

Much has been added to the store of agricultural and silvicultural knowledge through Hydro's research into methods of applying fertilizers and weed-killers on Con



ission property, from studies of food preservatives and fungicides, from large-scale experiments on rush control along transmission line rights-of-way with chemical sprays applied from the ground and from the air, from insect control studies, and from investigations undertaken from time to time in cooperation with such bodies as the Ontario Agricultural College. An example of the latter is a series of experiments on crop-drying methods, which included measurements of the airflows in a typical dry-mow. The laboratory has also developed an electrical device to exterminate flies in dairy barns and food-handling establishments.

A recent contribution to chemical analysis methods has resulted from the research laboratory's work in the infra-red analysis of herbicides. This consists, briefly, of an optical method of determining the concentration of toxic chemicals in spraying solutions by observing the absorption bands in their infra-red spectrum. This method obviates lengthy and difficult analysis by conventional organic methods.

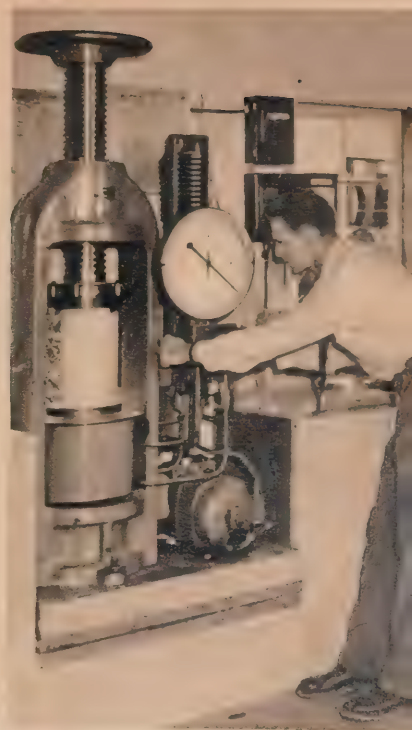
### Looking to the Future

As the province nears the end of its economically suitable for hydropower development, so Ontario Hydro has significantly increased its thermal-electric generating capacity. These innovations have opened up new fields of testing and research — gas analyses, determination of the heating values of different types of coal, thermal insulation studies and investigations into the control of grit and dust from smoke stacks, to mention but a few.

With the coming of nuclear power in the not-too-distant future, even broader avenues will be opened. In its never-ceasing efforts to meet Ontario's demands for power at the lowest possible cost, the Commission is confident that the technical problems, which must inevitably accompany these changes, will be solved, as they arise, by the staff of its Research Division. ■



△ ACCEPTANCE tests and inspection of approximately 1,500,000 lamps are conducted annually in this lamp life-test room to assist quality control of all lamps purchased by Hydro.



△ EIGHT of these machines are in use daily, testing sample 6 x 12-inch cylinders of concrete placed at all Hydro construction projects to determine the ultimate compressive strength.

△ THIS sonoscope device was developed by Hydro research engineers to evaluate the soundness of concrete in structures.



△ EXHAUSTIVE studies by Hydro's research engineers have made it possible to effect better control over brush and woody growth along Hydro transmission routes by chemical sprays.

# PAST PRESENT AND FUTURE

Ceremonies at St. Jacobs and  
Kitchener roll back the curtain on  
the past and set the pattern for the  
years ahead



△  
GORDON H. FULLER, O.M.E.A. President,  
standing, left, watches as Hon. Louis O. Breithaupt, Lieutenant-Governor of Ontario, formally unveils the monument to the late E. W. B. Snider.

ANIMATED by the magic of drama, light and music and touched by the eloquence of the spoken word, Time rolled back her curtain in Kitchener on the evening of May 14 this year to again bring into focus bygone years of this century when Hydro was but a dream in the minds of a few men.

Planned and presented under the aegis of the Ontario Municipal Electric Association as a tribute to Ontario Hydro, the event dramatically pointed up the historic Act of the Ontario Legislature, which received Royal Assent on May 14, 1906, to pave the way for the creation of Ontario Hydro.

Preceding the Golden Jubilee celebrations at Kitchener was a brief but eloquent tribute to the memory of one of the chief architects of Ontario's publicly-owned Hydro organization — Elias Weber Bingeman Snider.

Held at nearby St. Jacobs, on a windswept hill overlooking the prosperous community where Mr. Snider lived for the greater part of his life, the ceremony had, as its focal point, the unveiling of a slender obelisk of Queenston limestone in Mr. Snider's memory by Hon. Louis O. Breithaupt, Lieutenant-Governor of Ontario and representative of another distinguished Waterloo County family.

Presiding at the afternoon ceremony, attended by an impressive assembly of citizens, including Hydro representatives from far-flung sections of the province was Gordon H. Fuller, Windsor, President of the Ontario Municipal Electric Association which, in co-operation with Ontario Hydro, was responsible for the construction of the memorial. Guests of honor for the occasion were the Lieutenant-Governor and Mrs. Breithaupt. Other platform guests included Lt.-Col. G. E. Eastman, A.D.C.; Mrs. Gordon Fuller; Hon. W. K. Warrender, Ontario Hydro Vice-Chairman; Lt.-Col. A. A. Kennedy, Ontario Hydro Commissioner; W. W. Snider, and Miss Amy Snider, son and daughter of the Hydro pioneer.

Other guests were Norma Schneider, M.P. (Waterloo North); John W. Wintermeyer, M.P. (Waterloo, N.); Reeve Walter F. Geisel, Woolwich Township; F. J. Welker, Superintendent, St. Jacob Hydro System and E. A. Washburn, Stratford, President of the Association of Municipal Electrical Utilities (of Ontario).

In his speech of tribute to "E.W.B." (as Mr. Snider was familiarly known), Mr. Fuller described him as both a practical man and a public-spirited citizen. "Like his forefathers, he was a man of conviction, a man of faith and above all, a man of determination," Mr. Fuller stated.

## Unusual Initiative

These same qualities were stressed by the Lieutenant-Governor prior to unveiling the monument. Snider's public spirit and sense of responsibility toward his community were reflected not only in his role in the establishment of Ontario Hydro, but also in his service as member for Waterloo North in the Ontario Legislature.

"It is significant but natural that a grandson, A. M. Snider, of Waterloo, has been called upon by the government of this province to assume the great responsibility of Chairman of the Ontario Water Resources Commission to render service similar in many respects to his esteemed grandfather," the Lieutenant-Governor observed.

At the conclusion of his remarks Mr. Breithaupt released the cord to unveil the monument. As the covering fell away from the monument it revealed a 20-foot shaft, striking in the simplicity of its design and surmounted by a lamp which, perpetually-illuminated, will be visible for miles around. Cut into the stone at the base of the monument are these words:

"TO THE MEMORY OF ELIAS WEBER BINGEMAN SNIDER IN RECOGNITION OF HIS LEADERSHIP IN PROMOTING ONTARIO'S PUBLICLY OWNED "HYDRO" ENTERPRISE TO SERVE THE COMMON GOOD. Erected by the



Ontario Municipal Electric Association and The Hydro-Electric Power Commission of Ontario on the Fiftieth Anniversary of the Commission. Unveiled May 14, 1956, by The Honourable Louis O. Breithaupt, LL.D., Lieutenant-Governor of Ontario." The opposite side of the monument bears a bronze plaque with the following inscription:

'ELIAS WEBER BINGEMAN SNIDER, 1842-1921. Legislator and industrialist, E. W. B. Snider was one of the fathers of Ontario Hydro. At Berlin, on June 9, 1902, and again on February 17, 1903, he was Chairman of the meetings that gave birth to public power. He became Chairman of the Ontario Power Commission on August 12, 1903. His efforts, and those of his colleagues, led to the creation of The Hydro-Electric Power Commission of Ontario in 1906. Known to the last as a "careful, clear-headed man," E. W. B. Snider died on October 15, 1921, leaving monuments to his practical idealism that illumine his works for this and other generations."

Following a short prayer of dedication by Rev. A. M. Schlenker of the Evangelical United Brethren Church, St. Jacobs, of which the Snider family are members, Mr. Muller read aloud the inscriptions on the monument. "May these words remind us," he concluded, "and future generations who may stand here, as we are standing today, of a truly great Canadian."

### Early Days Recalled

It was appropriate that the ceremonies should conclude with an address by W. W. Snider, E. W. B.'s son, who acknowledged a sense of gratification that such a monument had been erected to honor the memory of his father. Now 82 years of age, Mr. Snider said that the ceremonies had brought back many memories of his father and the early days of the campaign for Hydro.

Mr. Snider thanked Ontario Hydro and the O.M.E.A. for the



△ MRS. DETWEILER, Kitchener, widow of D. B. Detweiler, an early advocate of public ownership of Ontario's power resources, examines the inscription on the Snider monument with Lieutenant-Governor Breithaupt and W. W. Snider, St. Jacobs, a son of the late E. W. B. Snider, after the unveiling.



△ SOME 800 persons, including Hydro representatives from many sections of Ontario, attended the gala Jubilee dinner and dramatic presentation in the Memorial Auditorium at Kitchener on May 14.



HONORING the 14 original municipalities, which signed power contracts in 1908, Ontario Hydro Commissioner A. A. Kennedy, left, presented framed \$2 bills to representatives of these municipalities, including Bert Merson, Chairman, Toronto Electric Commissioners. ▷



monument which would keep alive the memory of "E. W. B." in the hearts of the residents of St. Jacobs and the citizens of Ontario. He also expressed his appreciation to the Department of Highways for their donation of five acres of land adjoining the monument to be used as a park.

"In the passing of 'E. W. B.,'" Mr. Snider remarked, "a dynamic flame went out. It is thus appropriate that we should have a new flame to remind us of a man who gave so freely for the common good."

With this well-deserved salute to the memory of a great citizen, the large crowd of more than 400 people moved away slowly, leaving the beacon-topped monument as tangible evidence of the grateful appreciation of the people of Ontario.

### Gala Dinner

The scene then shifted to Kitchener where 800 guests attended a gala dinner in the Kitchener Memorial Auditorium. It was fitting that Kitchener should have been chosen as the venue for this historic Golden Jubilee tribute to Hydro as this progressive city was the first of the 14 original municipalities to receive power from the Commission.

Following the dinner when the doors of the auditorium were thrown open to the public, J. W. Washburn, Chairman of the Kitchener Public Utilities Commission, who presided, introduced the distinguished guests and their wives seated at the head table and called upon the various speakers.

Greetings and best wishes for the future success of Hydro were extended by the Lieutenant-Governor.

Mr. Breithaupt said the large gathering manifested the enthusiasm for Hydro that was evident in Kitchener 50 years ago.

"No city in Canada could draw a better attendance or present a better show than is exemplified by this great audience tonight."

The formal reply to the Lieute-

nant-Governor's address was presented by Hon. W. K. Warrender, Q.C., M.L.A., Hydro Vice-Chairman, while civic greetings were extended by Mayor F. L. Dreger, Kitchener, and Mayor Leo. J. Whitney, Waterloo.

### Municipal Presentations

A highlight of the Jubilee event was the presentation, by Ontario Hydro Commissioner Lt.-Col. A. A. Kennedy, of framed \$2 bills to representatives of the 14 municipalities, which made the original agreements for power on May 4, 1908.

These presentations, symbolic of personal contributions made to early meetings devoted to the public power principle were received on behalf of their municipal electrical utilities by: Mayor Bernadette Smith, Woodstock; Harvey Hawke, Galt; F. W. Dixon, Guelph; J. A. Bowman, Ingersoll; J. W. Washburn, Kitchener; V. A. McKillop, London; C. K. Merner, New Hamburg; O. J. Little, Preston; George Glover, St. Marys; P. R. Locke, St. Thomas; W. F. Nickel, Stratford; Bertam Merson, Toronto; H. M. Scheifele, Waterloo, and Grant Charlton, Hespeler.

In proposing the toast to Ontario Hydro, Gordon Fuller, President of the O.M.E.A., recalled that in the early years of the present century members of municipal councils and private citizens had banded together to form the Niagara Electric Power Union. The Union conducted a crusade in connection with the early Hydro movement and did much of the spade-work in laying the foundations of The Hydro-Electric Power Commission of Ontario. Some years after the Commission came into being, Mr. Fuller stated, the Niagara Electric Power Union was reorganized on a wider basis and renamed the Ontario Municipal Electric Association.

"The O.M.E.A., therefore," he said, "may be said to have been present at the birth of Ontario Hydro, and to stand in relation to that organization in something of the nature of godparent."

"From its modest beginnings Hydro has become an organization with total assets today approaching two billion dollars, and providing direct employment for 19,000 residents of this province, of whom 13,400 are permanent Hydro staff. It also operates 65 hydro-electric generating stations and two major thermal-electric plants to serve directly and indirectly more than one and a half million customers."

In conclusion, Mr. Fuller read a message, which he had received from Dr. Richard L. Hearn, Chairman of Ontario Hydro, who, at the time of the Kitchener event, was in Britain on official business.

In replying to the toast, W. Ros Strike, Q.C., Hydro Vice-Chairman paid warm and eloquent tribute to the members and staff of the Ontario Commission and to the members and staffs of the local commissions throughout Ontario for the contribution, individually and collectively, they had made to the progress of Hydro.

"The Hydro organization, both provincial and municipal, has been built on the firm and solid foundation of some very wise, time-tested and strictly honest and ethical principles and practices, and from these we must never depart if we are to survive. This appears to be a good spot to set the record straight and to state unequivocally that Ontario is not facing an impending electric power shortage, nor a diminishing power supply. It is true that, in the course of time, our base supply may be taken from sources of power other than hydraulic, but the demands for electricity will be met from combined resources, whatever they may be."

In conclusion, Mr. Strike said "As we face the future, we must carefully guard against the danger inherent in all great expansions. We must always remain flexible to meet changing conditions and constantly seek improvements in the art of generation and distribution but above all, we must hold firmly to the fundamental principles upon which our organization has been so firmly and securely built."



## Recalls Pioneer Work

Presenting the key address of the evening — "The Firm Foundation," Dr. Marcus Long, Associate Professor of Philosophy at the University of Toronto, recalled the pioneer work of D. B. Detweiler, J. W. B. Snider and Adam Beck that led to the formation of Ontario Hydro.

"Perhaps, the fact the public has forgotten about the difficulties they encountered is the best measure of the success of Hydro. Hydro is today so completely established in the public confidence it can no longer be destroyed by its enemies. Its continued success is assured so long as those responsible for its fortunes maintain the vision, wisdom, industry and personal integrity of its founders and builders."

Under the auspices of Hydro, the people of Ontario had joined the ranks of the greatest users of electricity in the world. In 1955, the approximate per capita consumption in the province was 5,000 kilowatthours as compared with 300 kilowatthours for the United States and 1,600 kilowatthours in Great Britain.

Even in the field of information and entertainment, he went on, new vistas had been opened up by electricity. Last year there were 103,000 radios in Ontario, and since 1949 almost one million television sets had been placed in Ontario homes. "It may be of interest to note," continued Dr. Long, "that it takes as much electricity to supply the television sets of Ontario as would be needed to supply the cities of Kitchener, Guelph, London, Windsor and Port Arthur with peak loads."

Demands for electricity in this expanding province, Dr. Long stated, would soon outstrip present sources of energy. Great ingenuity had been exercised to get more power from Niagara, and the St. Lawrence power project was now well on its way after years of frustrating delay. It required no great gift of prophecy to see that even these new sources of energy would not long be sufficient. Ontario was

now in the atomic age and Hydro had to march forward with it. Leaders of Hydro, he pointed out, were well aware of the new situation and were already working towards the day when nuclear energy would be used to meet the growing demands of manufacturers, householders and farmers in Ontario. It had been estimated, he stated, that, within 25 years only about one quarter of the power needs of Ontario Hydro would be supplied from water sources.

As water takes a lesser place in the production of electricity there may arise a feeling that the title "Hydro-Electric" is obsolete and should be replaced.

"If that day should come, then at least we may hope that the spirit, which produced Hydro, will not become obsolete and that the great principles inscribed in it will not be rejected with its title."

## Spiritual Birthplace

"Tonight in the City of Kitchener, the spiritual birthplace of Hydro, we are going to recall some of the great moments of Hydro's history. We will recall the names of the Ontario Hydro Chairmen: Beck, Magrath, Cooke, Lyon, Hogg, Saunders and Hearn, who have contributed, each in his own way, to its continued success. We should at this time also recall the other



△ DURING the Jubilee dramatic presentation, Alan Adlington as D. B. Detweiler greets Ontario citizens as he seeks support for his one-man campaign on behalf of public ownership of the province's power resources.



△ E. W. B. Snider (played by Wes. Callander) standing, portrays dramatic moment in the presentation as he talks to his son W. W. Snider (played by Donald Snider, great great-grandson of E. W. B.)

JUBILEE audience watches the parade of the original 14 municipalities, which signed contracts for power with Ontario Hydro in 1908.







RECALLING the inauguration of Hydro service at Berlin (now Kitchener) on October 11, 1910, Premier Whitney (Alex Dick), right, takes the hand of Hon. Adam Beck (J. W. Symons) to press a symbolic button held by Hilda Rumpel (Carol McAdam).



MRS. LANDOR READE, Toronto (left), who, as Hilda Rumpel (her maiden name in 1910), participated in the actual ceremony, extends congratulations to Miss McAdam.

men, some of whom are happily with us as our guests, who gave their dedicated service to the cause of this great public enterprise. And as we do so we will close the chapter on the first 50 years and face a future with even greater challenges and opportunities determined to continue building well on the firm foundation laid by others," Dr. Long concluded.

### Dramatic Highlight

Representing the climax of this historic event was the dramatic presentation entitled "The Beacon," specially written for the occasion by Horace Brown, an Ontario Hydro staff writer, who also proved

himself an able producer and narrator. The entire production reflected the work, not only of Mr. Brown and Ralph Ashton, the director, but the team effort of the entire cast of the Kitchener-Waterloo Little Theatre Group.

Presented on a cleverly-improvised stage at one end of the spacious arena, which was spanned by colorful, Hydro Jubilee banners, the production moved along with a professional finesse. Lighting and music were employed with a marked degree of skill to accentuate the varying "moods" of the presentation. As it unfolded, the panorama of scenes brought to life figures who

were prominent on the Ontario scene when Hydro was a great crusade. The correct attire of the era worn by the members of the cast and snatches of "Gay Ninety" songs combined to add a note of nostalgic realism to the production. The presentation also featured a stirring re-enactment of the historic ceremony at Kitchener (then Berlin) on October 11, 1910, when Sir James Pliny Whitney, then Premier of Ontario, took the hand of Adam Beck to press the button, an act which made Kitchener the first of the original 14 municipalities to receive Hydro power.

Alan Adlington starred in the role of D. B. Detweiler, sharing honors with Wes. Callander and E. W. B. Snider, and J. W. Symons as an impressive Adam Beck. Alex Dick gave a very faithful portrayal of the role of Premier Whitney and Carol McAdam as Hilda Rumpel, the young girl who carried the button on a velvet cushion to Premier Whitney in 1910, showed marked poise and grace.

A delightful surprise of the evening was the announcer that the original Hilda Rumpel was in the audience. The Miss Rumpel of 1910, now Mrs. Landor Reade, was called to the stage to receive a bouquet of flowers from Miss McAdam.

The fine work of the cast as a whole also reflected the close attention to such details as make-up handled by Earl W. Stieler, and costumes, which were the responsibility of Madeleine Batson and Kathleen Breckenreid.

The musical program in itself merited highest praise. The audience will long remember the 35-voice Schneider-Orpheus Male Choir, directed by Paul Berg, and the vocal contributions of Miss Ivy Patrason, who was accompanied by Miss Ada Eby.

Thus Hydro turned from this memorable review of its first 50 years of service to the citizens of Ontario with fresh confidence in the events and challenges of the future.





CHARLES A. MAGRATH  
Chairman, 1925-1931



HON. J. R. COOKE, M.L.A.  
Chairman, 1931-1934



T. STEWART LYON  
Chairman, 1934-1937



HON. SIR ADAM BECK,  
Kt., LL.D., M.L.A.  
Chairman, 1906-1925



THOMAS H. HOGG,  
D. Eng.  
Chairman, 1937-1947



ROBERT H. SAUNDERS,  
C.B.E., Q.C.  
Chairman, 1948-1955



RICHARD L. HEARN,  
B.A.Sc., D.Eng.  
Appointed Chairman,  
1955

## The Helmsmen 1906 - 1956

















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